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ANNOTATED LIST OF SPECIES

An updated checklist of the Asteraceae of Ñeembucú, Paraguay

Nélida Soria Rey[1,2], Juana De Egea Elsam[3,4]

1 *Facultad de Ciencias Aplicadas, Universidad Nacional de Pilar, Pilar, Paraguay*
2 *Sociedad Científica del Paraguay, Asunción, Paraguay*
3 *Centro para el Desarrollo de la Investigación Científica, Asunción, Paraguay*
4 *Departamento de Botánica, Facultad de Ciencias Químicas, Universidad Nacional de Asunción, San Lorenzo, Paraguay*

Corresponding author: *Nélida Soria Rey (nsoria2000@yahoo.com)*

Abstract. Ñeembucú is one of the least surveyed departments of Paraguay in terms of floristic diversity, largely due to its flooded topography, which has limited the accessibility to its wild areas. Previous work has systematised 676 taxa of vascular plants, demonstrating floristic richness and emphasizing the information gaps that still exist. Considering that Asteraceae is one of the largest botanical families in Paraguay, as an update to the knowledge of the flora of Ñeembucú, we present here an updated list of 88 species of Asteraceae from the Ñeembucú region, represented by 58 genera within 17 tribes. Out of these 88 species, 50 are new departmental records for Ñeembucú, and one is a new national record for the Paraguayan flora. This work highlights the importance of regular monitoring and constant updating of biodiversity data to support sustainable development in the face of the rapid advancement of agriculture and forestry projects threatening natural ecosystems.

Key words. Biodiversity, Compositae, conservation, flora, humid Chaco, new distribution records, wetlands.

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INTRODUCTION

Paraguay is a land-locked country between 19°18′–27°03′S and 054°15′–062°38′′W at the heart of the South American continent (Benítez et al. 2023), and lies entirely within the Río de la Plata drainage system, the second largest in South America, behind only the Amazon basin (Rieu-Clarke et al. 2012). The country is divided by the Paraguay River into the Oriental region (also known as the Paraná region) and the Occidental region (also known as the Chaco), which forms part of the Gran Chaco Americano that is shared between Argentina, Bolivia and Paraguay (De Egea et al. 2012). The country is divided into 17 departments, 14 of which lie to the east of the Río Paraguay (De Egea et al. 2012). It is an ecologically unique country, resulting from its location at the convergence of five ecoregions: the Atlantic Forest, the Humid Chaco, the Dry Chaco, the Pantanal, and The Cerrado, all of which contribute to its floristic richness (Huang et al. 2009; Bueno et al. 2017; Peña-Chocarro and De Egea 2018). Spichiger et al. (2011) stated that Paraguay may be viewed as a large and diversified ecotone in South America.

The Department of Ñeembucú has been one of the least explored and documented areas of Paraguay in terms of floristic diversity (De Egea et al. 2012). This is mainly due to the historical difficulties of accessibility to its wild areas, resulting from its flooded terrain and lack of drivable roads (Fogel 2000). Consequently, the heterogeneous vegetation with ecotonal features of Ñeembucú has been largely undervalued against other ecoregions such as the Atlantic Forests, the Cerrados, and the Chaco. A brief overview of botanists and their major explorations carried out in Ñeembucú can be found in De Egea et al. (2012), from the late 19th century to present. The most recent checklist of the vascular plants of Ñeembucú included 676 taxa, distributed in 100 families and 374 genera (De Egea et al. 2012), demonstrating an interesting floristic richness, but also highlighting the information gaps that still exist.

The Department of Ñeembucú lacks large, protected areas for the conservation of its wetlands and forests. Just over 400 km^2 are under protection, equivalent to only 3.3% of its area, which makes up part of the Ypoá National Park. This park is shared with the Central and Paraguarí departments and was designated a Ramsar Site in 1995, along with the Natural Monuments Laguna Méndez and Sissi (MADES/PNUD 2020). Furthermore, the expanding agricultural frontier, deforestation, and environmental degradation all represent serious threats to the wetlands and forests of Ñeembucú (Yanosky and Salas-Dueñas 2004). In particular, wetlands and other wild areas of Ñeembucú are threatened by artificial drainage systems

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created with the purpose of gaining areas of productive land (Yanosky and Salas-Dueñas 2004). These areas are dedicated to forestry with exotic trees, and intensive cattle ranching through the implementation of unsustainable practices that require the introduction of non-native grasses, intensive grazing, and uncontrolled burning of pastures; all these activities have caused extensive, negative impact in recent years (Vogt and Mereles 2005). Consequently, the shortage of protected areas and changes in land use, with few alternatives for sustainable production compatible with conservation, threaten biodiversity and the complex ecological systems of Ñeembucú (De Egea et al. 2012), emphasizing the need for better understanding of its natural resources to support conservation initiatives.

Asteraceae is one of the the largest and most dominant families of flowering plants on Earth (Mandel et al. 2019). It comprises about 1,700 genera and ca. 25,000 species worldwide, which constitutes approximately 10% of the world's flowering plant diversity (Mandel et al. 2019). This family has widely distributed taxa, found in all continents except Antarctica, and in almost all types of environments (Funk et al. 2009; Palazzesi et al. 2022), although they prefer open areas, meadows, fields, steppes, and only a few have an aquatic or marshy habit or are characteristic of waterlogged soils that tolerate frequent flooding (Soria 2016). In Paraguay, it is one of the largest families, with 149 genera and 539 species recorded so far (Zuloaga et al. 2019). De Egea et al. (2012) listed 37 species of Asteraceae for Ñeembucú, 13 of which were new records for the department, and one was a new record for the country. Asteraceae was also the third most taxon-rich family of the flora of Ñeembucú, after Poaceae and Fabaceae (De Egea et al. 2012).

We sought to answer how much new data has been generated for the flora of Ñeembucú within the last 12 years, since the previous checklist (De Egea et al. 2012). We wanted to evaluate the representativeness of the previous checklist, as well as the information gaps then underlined by the authors. Considering the diversity and ecological importance of the Asteraceae, this study aims to contribute towards the knowledge of the flora of Ñeembucú, focusing on the Asteraceae as a good indicator of its overall floral biodiversity.

STUDY AREA

The Department of Ñeembucú (25°35′–27°20′S and 056°35′–058°40′W) lies in the southwestern quadrant of the Oriental region of Paraguay and covers an approximate area of 12,147 km^2 (Benítez et al. 2023). Ñeembucú is bordered by the Paraguay and Paraná rivers along its west and south boundaries, respectively (DGEEC 2002) (Figure 1). The average annual temperature is between 22° and 23°C, and average annual rainfall is around 1,500 mm (Acevedo et al. 1990). Most of this area is made up of a plain comprised of alluvial sediments from the Quaternary period, with hydromorphic soils formed from the transport of sediment by rivers and streams, and dominated by shallow hydromorphic and alluvial gley types, planosols, or gley humic acids with high organic matter content (Acevedo et al. 1990).

The area is low in elevation and relatively flat; altitudinal range is between 50 and 124 metres above sea level (Fogel 2000). The natural vegetation is characterised by a predominance of grasslands, periodically or permanently flooded wetlands, palm savannahs with *Copernicia alba* Morong or *Butia paraguayensis* (Barb. Rodr.) L.H. Bailey as the dominant palm trees, riparian forests, and semi-deciduous sub-humid forests on islets (Acevedo et al. 1990; Vogt and Mereles 2005; De Egea et al. 2012; Cartes et al. 2016). The Ñeembucú Department belongs to the Ñeembucú Ecoregion of Paraguay (Acevedo et al. 1990; MADES/PNUD 2020), and it is classified within the biome of tropical and subtropical grasslands, savannahs, and shrublands (Olson et al. 2001) and the Chacoan Province (Cabrera and Willink 1973; Morrone 2014).

As a result of the particular topographic and hydrographic features, Ñeembucú is usually described as an extensive floodplain (Fogel 2000). Over 85% of this area is wetlands (Fogel 2000), where water is the primary factor that regulates seasonal variation and biological and ecological characteristics of the floral composition (Fogel 2000). The wetlands of Ñeembucú are the largest in the Oriental region and are very rich in terms of alpha and beta diversity, particularly when it comes to species of flora and fauna closely linked to water (Vogt and Mereles 2005).

The wetlands and forests of Ñeembucú comprise physical features and species composition similar to the humid Chaco. Thus, they are regarded as intrusions of Chaco vegetation into the Oriental region (Mereles 2004; Vogt and Mereles 2005). However, the sandy layer, which emerges in many parts of the department, results in the development of more diverse and transitional habitats (Mereles 2004). Consequently, the vegetation of Ñeembucú is a mosaic of species typical of both the Eastern and Western (Chaco) regions (Mereles 2004). Spichiger et al. (1995) described the tree flora of Ñeembucú as "a most interesting boundary zone between the Chacoan, the Palm-Savannahs, the Residual Pleistocenic Dry Seasonal, and the Paranean Floras", i.e., an ecotone between dry forests, wet forests, and savannahs.

METHODS

We built the checklist of the Asteraceae of Ñeembucú based on two sources of data:

1) The sampling and collection of Asteraceae species occurring in key sites, selected according to accessibility (availability of roads and entry permissions to private properties issued by the owners), and

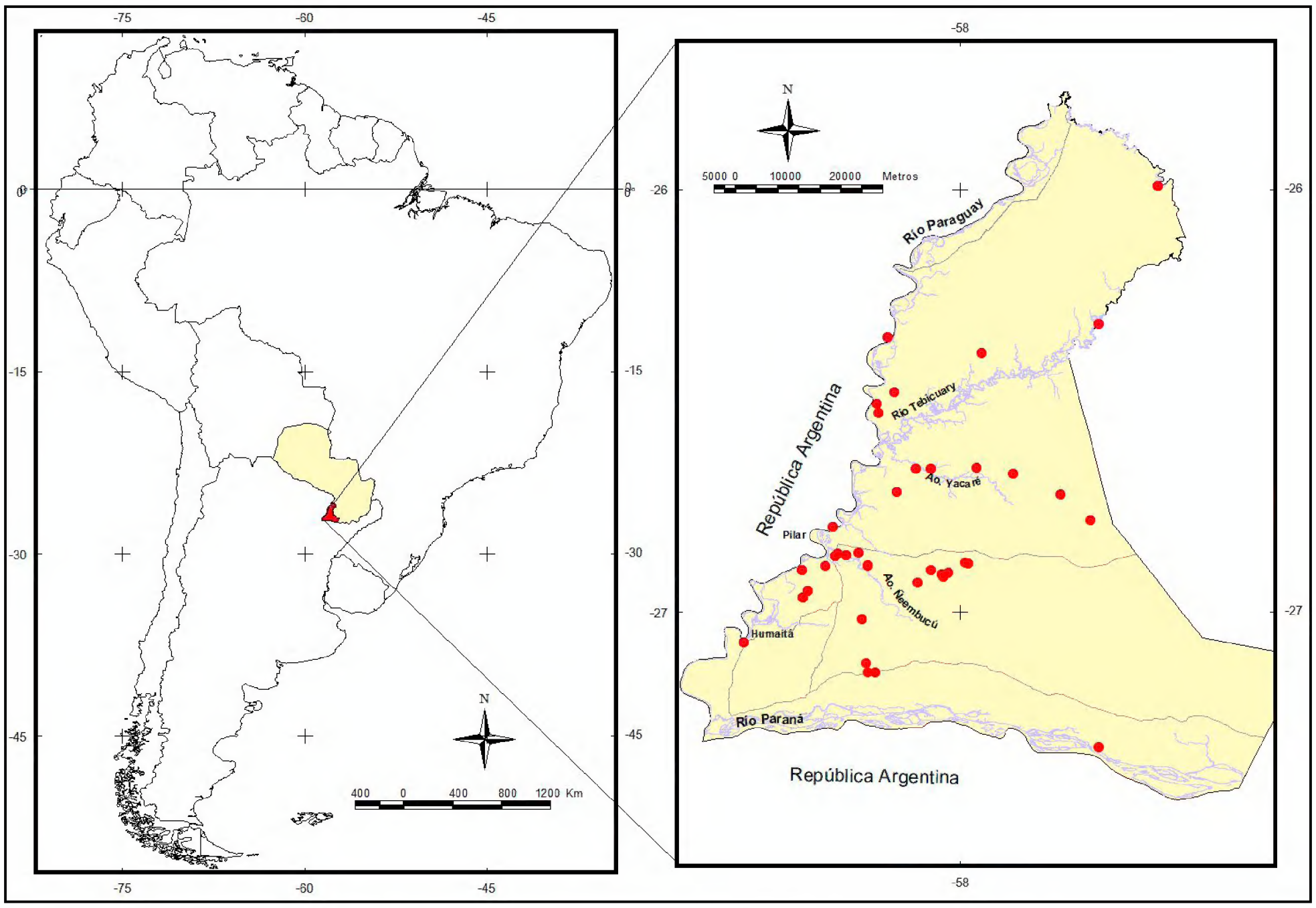

Figure 1. Location of the Department of Ñeembucú in Paraguay (red dots indicate sampling points).

the presence of several types of vegetation from areas with different conservation status, ranging from wild areas to cattle grazing fields, cropfield surroundings, and suburban areas (Figure 1). Each site was surveyed once. We surveyed a series of random, georeferenced points (up to 8 per day) to collect the plants occurring within a 50 m radius. We carried out intensive sampling in the winter, spring, and summer months of 2022 (August, September, October, November, December); collection of herbarium samples were always made with flowers and/or fruits. Herbarium specimens were dried and deposited in the Facultad de Ciencias Químicas, Universidad Nacional de Asunción, Paraguay (FCQ) (Thiers 2024). Identification of specimens was made with the use of traditional taxonomic methods and the relevant literature available for the country and region (Cabrera 1974; Soria and Zardini 1995; Cabrera et al. 1996; Cabrera and Freire 1998; Cabrera et al. 2009; Soria and Mereles 2022).

2) The revision of herbarium specimens in CTES, FCQ, G, LP, MO, PY, and SCPY (Thiers 2024), as well as the systematization of data available in the literature (Soria and Zardini 1995; Cabrera et al. 1996; Cabrera and Freire 1998; Cabrera et al. 2009; De Egea et al. 2012; Soria 2016; Zuloaga et al. 2019; Soria and Mereles 2022) and in databases of relevant herbaria (CHG 2024; Tropicos.org 2024).

We compiled voucher information for each taxa present in Ñeembucú in a spreadsheet database. Taxonomic classification, regarding subfamilial and tribal circumscription, follows The Compositae Global Database (Compositae Working Group 2024). Nomenclatural data follows the International Plant Names Index (IPNI 2024) and accepted names are in line with The Compositae Global Database (Compositae Working Group 2024).

In the checklist, species are sorted alphabetically within tribes, and then alphabetically within subfamilies. For each taxon, we present the accepted name, general distribution in Paraguay by departments (Figure 2), residence status (all species are native except where indicated), global distribution (based on the relevant literature and the revised specimens from the consulted herbaria), and one voucher specimen, specifying the collector's last name and collection number, as well as the herbarium code number or barcode. We provide species-level identification for the newly recorded taxa, based on key characters.

DATA RESOURCES

The data underpinning the checklist reported in this paper were deposited on 27 July 2024 at GBIF, the Global Biodiversity Information Facility, http://ipt.pensoft.net/ipt/resource.do?r=xxxxxx

RESULTS

This checklist documents a total of 88 species of Asteraceae for the Ñeembucú Department of Paraguay, distributed among 58 genera within 17 tribes (Table 1, Figures 3–7). First reports for the department (50) and for the country (1) are indicated. However, the following four species mentioned in taxonomic literature, for which specimens were not found during this revision, were nevertheless included: *Erigeron primulifolium* (Lam.) Greuter (Astereae), *Barrosoa candolleana* (Hook. & Arn.) R.M. King & H. Rob. (Eupatorieae, Figure 3H), *Chromolaena squarrulosa* (Hook & Arn.) R.M. King & H. Rob. (Eupatorieae), and *Centraterum punctatum* Cass. (Vernonieae, Figure 7E).

Table 1. List of Asteraceae from the Department of Ñeembucú, Paraguay. New records for the Department are marked with (*) and new records for the country with (u).

Subfamily and tribe		Taxon	Life form	Voucher reference
Subfamily Asteroideae (Cass.) Lindl.				
Anthemideae	*	*Soliva sessilis* Ruiz & Pav.	Herb	FCQ59817
Astereae	*	*Baccharis breviseta* DC.	Subshrub	FCQ59800
	*	*Baccharis dracunculifolia* DC.	Shrub	FCQ59801
	*	*Baccharis glutinosa* Pers.	Herb	FCQ59859
		Baccharis microcephala DC.	Subshrub	G00092038
	*	*Baccharis notosergila* Griseb.	Shrub	FCQ59902
		Baccharis phyteumoides (Less.) DC.	Subshrub	FCQ22711
		Egletes viscosa (L.) Less.	Herb	LP3250561
	*	*Erigeron bonariensis* L.	Herb	FCQ59850
		Erigeron primulifolium (Lam.) Greuter	Herb	Zuloaga et al. 2019: 165
		Exostigma notobellidiastrum (Griseb.) G. Sancho	Herb	FCQ59863
	*	*Grindelia puberula* Hook. & Arn.	Shrub	FCQ59834
	*	*Solidago chilensis* Meyen	Herb	FCQ59872
	*	*Symphyotrichum graminifolium* (Spreng.) G.L.Nesom	Herb	FCQ59791
Coreopsideae	*	*Bidens pilosa* L.	Herb	FCQ59906
	*	*Bidens subalternans* DC.	Herb	FCQ59791
	*	*Isostigma peucedanifolium* (Spreng.) Less.	Herb	FCQ59921
Eupatorieae	*	*Austroeupatorium inulifolium* (Kunth) R.M. King & H. Rob.	Shrub	FCQ59877
	*	*Austroeupatorium laetevirens* (Hook. & Arn.) R.M. King & H. Rob.	Subshrub	FCQ59897
		Barrosoa candolleana (Hook. & Arn.) R.M. King & H. Rob.	Herb	Cabrera et al. 1996: 57
		Campuloclinium macrocephalum (Less.) DC.	Herb	FCQ48985
	*	*Campuloclinium purpurascens* (Baker) R.M. King & H. Rob.	Herb	FCQ59887
	*	*Chromolaena christieana* (Baker) R.M. King & H. Rob.	Shrub	FCQ59879
		Chromolaena hirsuta (Hook. & Arn.) R.M. King & H. Rob.	Subshrub	SI043194
	*	*Chromolaena ivifolia* (L.) R.M. King & H. Rob.	Subshrub	FCQ59867
		Chromolaena orbignyana (Klatt) R.M. King & H. Rob.	Shrub	FCQ48808
		Chromolaena squarrulosa (Hook. & Arn.) R.M. King & H. Rob.	Subshrub	Cabrera et al. 1996: 186
		Gymnocoronis spilanthoides (D. Don ex Hook. & Arn.) DC.	Herb	FCQ59844
	*	*Hatschbachiella tweedieana* (Hook. & Arn.) R.M. King & H. Rob.	Subshrub	FCQ59797
	*	*Heterocondylus grandis* (Baker) R.M. King & H. Rob.	Herb	FCQ59866

Subfamily and tribe		Taxon	Life form	Voucher reference
	*	*Mikania cynanchifolia* Hook. & Arn. ex Baker	Vine	FCQ59875
	*	*Mikania micrantha* Kunth	Vine	FCQ59852
		Mikania periplocifolia Hook. & Arn.	Vine	FCQ59876
		Praxelis clematidea (Hieron. ex Kuntze) R.M. King & H. Rob.	Herb	FCQ59890
		Praxelis kleinioides (Kunth) Sch. Bip.	Herb	G00027584
		Praxelis ostenii (B.L. Rob.) R.M. King & H. Rob.	Herb	FCQ59883
		Urolepis hecatantha (DC.) R.M. King & H. Rob.	Herb	BM000934280
Gnaphalieae	*	*Gamochaeta americana* (Mill.) Wedd.	Herb	FCQ59826
	*	*Gamochaeta simplicicaulis* (Willd. ex Spreng.) Cabrera	Herb	FCQ59865
	*	*Micropsis dasycarpa* (Griseb.) Beauverd	Herb	FCQ59825
Helenieae	*	*Hymenoxys anthemoides* (Juss.) Cass. ex DC.	Herb	FCQ59838
Heliantheae		*Acmella decumbens* (Sm.) R.K. Jansen var. *decumbens*	Herb	FCQ56275
	*	*Acmella glaberrima* (Hassl.) R.K. Jansen	Herb	FCQ59914
	*	*Acmella pusilla* (Hook. & Arn.) R.K. Jansen	Herb	FCQ59874
	*	*Ambrosia artemisiifolia* L.	Herb	FCQ59856
	*	*Aspilia montevidensis* (Spreng.) Kuntze	Herb	FCQ59862
		Aspilia pascalioides Griseb.	Herb	FCQ59830
		Aspilia silphioides (Hook. & Arn.) Benth. & Hook.f.	Herb	FCQ48839
	*	*Eclipta prostrata* (L.) L.	Herb	FCQ59831
	*	*Melanthera latifolia* (Gardner) Cabrera	Herb	FCQ59895
		Sphagneticola brachycarpa (Baker) Pruski	Herb	FCQ59900
	*	*Verbesina subcordata* DC.	Subshrub	FCQ59836
	*	*Wedelia subvaginata* N.E.Br.	Herb	FCQ59899
	*	*Xanthium spinosum* L. var. *spinosum*	Herb	FCQ59909
	*	*Xanthium strumarium* L.	Herb	FCQ59893
Inuleae	*	*Pluchea sagittalis* (Lam.) Cabrera	Herb	FCQ59870
		Pterocaulon lorentzii Malme	Herb	BM000934406
	*	*Pterocaulon purpurascens* Malme	Herb	FCQ59896
	*	*Pterocaulon rugosum* Malme	Herb	FCQ59812
	*	*Pterocaulon virgatum* (L.) DC.	Herb	FCQ59894
	*	*Tessaria dodoneifolia* (Hook. & Arn.) Cabrera subsp. *plucheoides* (Hassl.) S.E. Freire	Shrub	FCQ59790
		Tessaria integrifolia Ruiz & Pav.	Shrub	BM000934389
Millerieae	*	*Acanthospermum australe* (Loefl.) Kuntze	Herb	FCQ59928
		Acanthospermum hispidum DC.	Herb	G00107357
	*	*Tridax procumbens* L.	Herb	FCQ59792
Neurolaeneae	*	*Calea uniflora* Less. var. *uniflora*	Herb	FCQ59925
		Enydra anagallis Gardner	Herb	FCQ59891
Senecioneae	*	*Erechtites hieraciifolius* (L.) Raf. ex DC. var. *cacalioides* (Fisch. ex Spreng.) Less. ex Griseb.	Herb	FCQ59873
		Pseudogynoxys cabrerae H. Rob. & Cuatrec.	Shrub	G00093142
		Senecio pterophorus DC.	Herb	FCQ59861
Tageteae	*	*Porophyllum lanceolatum* DC.	Herb	FCQ59802
	*	*Porophyllum ruderale* (Jacq.) Cass.	Herb	FCQ59908

Subfamily and tribe		Taxon	Life form	Voucher reference
Subfamily Carduoideae Cass. ex Sweet				
Cardueae	u	*Carduus acanthoides* L. subsp. *acanthoides*	Herb	FCQ59833
		Cirsium vulgare (Savi) Ten. subsp. *vulgare*	Herb	FCQ49282
Subfamily Cichorioideae Chevall.				
Cichorieae		*Hypochaeris chillensis* (Kunth) Britton	Herb	FCQ49284
		Picrosia longifolia D. Don	Herb	FCQ59849
	*	*Sonchus oleraceus* L.	Herb	FCQ59907
Subfamily Mutisioideae (Cass.) Lindl.				
Mutisieae	*	*Chaptalia nutans* (L.) Pol.	Herb	FCQ59808
Nassauvieae	*	*Holocheilus hieracioides* (D. Don) Cabrera	Herb	FCQ59829
	*	*Trixis antimenorrhoea* (Schrank) Kuntze	Subshrub	FCQ59821
Subfamily Vernonioideae Lindl.				
Vernonieae		*Centratherum punctatum* Cass.	Subshrub	Cabrera et al. 2009:72
		Cyrtocymura scorpioides (Lam.) H. Rob.	Shrub	FCQ59913
		Lepidaploa remotiflora (Rich.) H. Rob.	Herb	FCQ59912
		Lessingianthus pseudoincanus (Hieron.) Dematt. & Angulo	Subshrub	G00026337
		Lessingianthus rubricaulis (Humb. & Bonpl.) H. Rob.	Subshrub	FCQ35992
		Pacourina edulis Aubl.	Herb	FCQ56481
		Vernonanthura chamaedrys (Less.) H. Rob.	Subshrub	FCQ59799
		Vernonia incana Less.	Herb	FCQ59922

The most species-rich tribes are Eupatorieae (20 taxa), Heliantheae (14), Astereae (13), Vernonieae (8), and Inuleae (7), followed by the remaining 12 tribes represented by 1–3 taxa each (Figure 8).

According to the Asteraceae life forms analysis, about 69% of the species in the checklist are herbs, 11% are subshrubs, 16% are shrubs, and only 3% are vines (Figure 9). Regarding the vegetation types occupied by the taxa documented (Figure 10), most of the species inhabit open vegetation types such as savannahs, grasslands, and prairies (38%) and many of them additionally exploit disturbed areas (17%) such as crop fields, cattle pastures, road edges, farms, urban and suburban areas, and modified soils. About 7% of the species are exclusively associated with forests, and another 13% are adapted to ecotonal conditions such as forest edges and clearings, many of them also present in savannahs and grasslands. Hygrophilous species strictly or closely associated with wetlands make up about 26% of the list.

Subfamily Asteroideae (Cass.) Lindl.
Tribe Anthemideae Cass.

***Soliva sessilis* Ruiz & Pav.**
Figure 3A

First report. PARAGUAY – Ñeembucú • Pilar; 26°51′25″S, 058°18′14″W; 3.XI.2022; Soria 8349 leg.; FCQ 59817.

Identification. Herbs, 5–10 cm tall. Leaves petiolate, deeply 2–3-pinnatisect, segments linear-lanceolate, acute. Capitula sessile. Florets dimorphic; ray florets pistillate without corolla; disc florets staminate, tubulose. Cypsela dorsally compressed, obovate, 2-winged; style persistent, spiniform.

Distribution in Paraguay. Alto Paraguay, Boquerón, Cordillera, Itapúa, Ñeembucú, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Grasslands, prairies, and modified soils.

Phenology. Flowers from November through February.

Figure 2. Political division of Paraguay into 17 departments.

Tribe Astereae Cass.

***Baccharis breviseta* DC.**

First report. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′35″S, 058°14′17″W; 17.VIII.2022; Soria 8331 leg.; FCQ 59800.

Identification. Subshrubs, 1–1.5 m tall. Leaves 6–13 × 0.5–0.8 cm, linear-lanceolate, glabrous, 3-nerved; apex acute, margin serrate, base attenuate. Capitula numerous, in corymbiform cymes. Florets dimorphic, white; ray florets numerous, pistillate, short filiform; disk florets few, estaminate, tubulose. Cypsela sparsely papillose with pappus.

Distribution in Paraguay. Caazapá, Concepción, Cordillera, Guairá, Itapúa, Ñeembucú.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Subhumid forests, riparian forests, and proximate to wetlands.

Phenology. Flowers throughout the year.

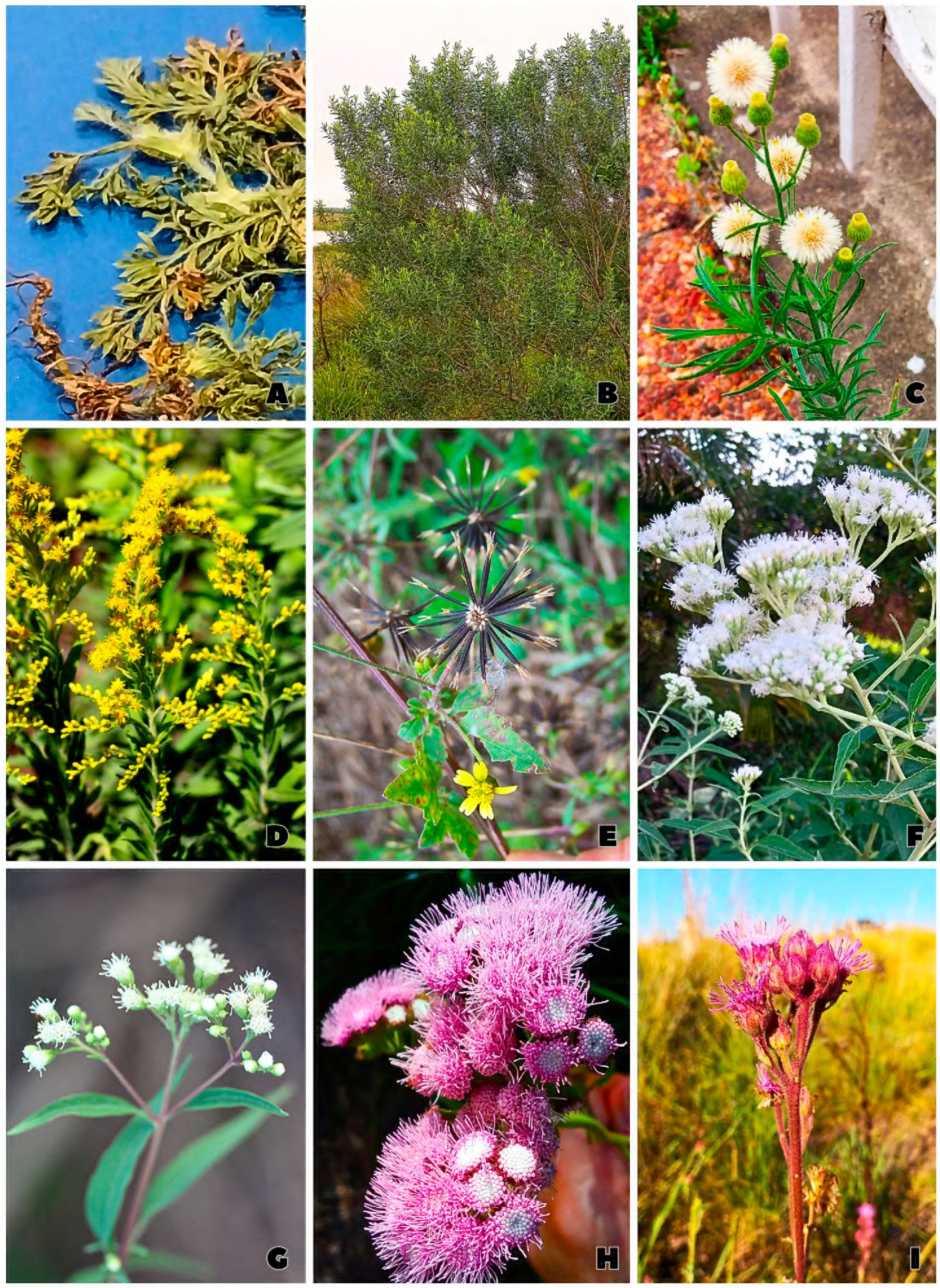

Figure 3. Representative Asteraceae tribes and species documented in Ñeembucú. **A.** Anthemideae; *Soliva sessilis*. **B.** Astereae; *Baccharis dracunculifolia*. **C.** Astereae; *Erigeron bonariensis*. **D.** Astereae; *Solidago chilensis*. **E.** Coreopsideae; *Bidens pilosa*. **F.** Eupatorieae; *Austroeupatorium inulifolium*. **G.** Eupatorieae; *Austroeupatorium laetevirens*. **H.** Eupatorieae; *Barrosoa candolleana*. I. Eupatorieae; *Campuloclinium macrocephalum*. (Photo credits: A, C, F: N. Soria. B, D, E, G, H, I: J. De Egea).

***Baccharis dracunculifolia* DC.**
Figure 3B

First report. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′35″S, 058°14′17″W; 17.VIII.2022; Soria 8332 leg.; FCQ 59801.

Identification. Dioecious shrubs or small trees, 1–2.5 m tall. Leaves 1–4 × 0.5–1 cm; alternate, oblanceolate, or oblong, glandular-punctate, entire or with 1–4 teeth on each side. Capitula sessile or short pedunculate, located in the axils of the upper leaves. Staminate florets tubulose, deeply 5-lobed; pistillate florets filiform. Cypsela with 8–10 prominent ribs and pappus.

Distribution in Paraguay. Amambay, Caaguazú, Caazapá, Canindeyú, Central, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Bolivia, Brazil, Paraguay, Uruguay.

Ecology. Riparian forests, savannahs, and modified soils.

Phenology. Flowers throughout the year.

***Baccharis glutinosa* Pers.**

First report. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°53′27″S, 058°19′05″W; 21.XI.2022; Soria & Stevens 8388 leg.; FCQ 59859.

Identification. Dioecious herbs, 1–1.5 m tall; gemmiferous roots; erect, glabrous, ribbed stems. Leaves 3–9 × 1–3 cm, alternate, petiolate, ovate, 3-nerved; apex acuminate, margin narrowly serrate, attenuate at the base. Capitula numerous, in terminal corymbiform cymes. Staminate florets tubulose, deeply 5-lobed; pistillate florets filiform. Cypsela costate, papillose, with pappus.

Distribution in Paraguay. Alto Paraguay, Amambay, Caaguazú, Canindeyú, Central, Cordillera, Guairá, Misiones, Ñeembucú, Paraguarí.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Grasslands and proximate to wetlands.

Phenology. Flowers throughout the year.

***Baccharis microcephala* DC.**

Material examined. PARAGUAY – Ñeembucú • Itá Pirú; 27°17′07″S, 058°34′05″W; 9.XII.1950; Schulz 7664 leg.; G 00092038.

Distribution in Paraguay. Caaguazú, Caazapá, Central, Cordillera, Guairá, Itapúa, Ñeembucú, Paraguarí, San Pedro.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Riparian forests and proximate to wetlands.

Phenology. Flowers from late September through March.

***Baccharis notosergila* Griseb.**

First report. PARAGUAY – Ñeembucú • Camino Pilar – Villa Franca; 26°21′03″S, 058°10′11″W; 25.XI.2022; Soria & Stevens 8433 leg.; FCQ 59902.

Identification. Dioecious shrubs, 0.50–1.5 m, glandulous, resinous, ramose, mostly aphyllous. Leaves early deciduous, when present linear, entire or with 2–3 teeth on each side. Capitula solitary, at the apex of the twigs. Staminate florets tubulose, deeply 5-lobed; pistillate florets filiform. Cypsela glabrous, costate, with silky, acrescent pappus.

Distribution in Paraguay. Caaguazú, Central, Cordillera, Ñeembucú, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Pristine savannahs, grasslands, and prairies.

Phenology. Flowers from November through May.

***Baccharis phyteumoides* (Less.) DC.**

Material examined. PARAGUAY – Ñeembucú • Cerrito; 27°19′52″S, 057°38′24″W; 1988; Keel & Spinzi 1462 leg.; FCQ 22711.

Distribution in Paraguay. Itapúa, Ñeembucú.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Riparian forests and wetlands.

Phenology. Flowers from December through February.

***Egletes viscosa* (L.) Less.**

Material examined. PARAGUAY – Ñeembucú • Pilar; 26°53′27″S, 058°19′05″W; XII.1950; Meyer 15856 leg.; LP 3250561.

Distribution in Paraguay. Alto Paraguay, Boquerón, Ñeembucú, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay.

Ecology. Riparian forests, palm savannahs, and proximate to wetlands.

Phenology. Flowers from September through March.

***Erigeron bonariensis* L.**
Figure 3C

First report. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′43″S, 058°17′14″W; 21.XI.2022; Soria & Stevens 8381 leg.; FCQ 59850.

Identification. Herbs, 0.40–1 m tall, densely pubescent. Leaves 3–6 × 0.3–0.7 cm, lower leaves oblanceolate, lobed or rarely entire, upper leaves linear or linear-lanceolate. Capitula numerous in terminal corymbiform cymes. Florets dimorphic, white; ray florets numerous, pistillate, filiform, short ligulate at apex; disk florets few, perfect, tubulose, 5-lobed. Cypsela sparsely pubescent, with white-pinkish pappus.

Distribution in Paraguay. Alto Paraguay, Amambay, Boquerón, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Native to South America, widely distributed all over the world.

Ecology. Grasslands, prairies, open secondary vegetation, and crop fields.

Phenology. Flowers throughout the year.

***Exostigma notobellidiastrum* (Griseb.) G. Sancho**

Material examined. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°53′27″S, 058°19′05″W; 21.XI.2022; Soria & Stevens 8393 leg.; FCQ 59863.

Distribution in Paraguay. Alto Paraná, Amambay, Caazapá, Canindeyú, Central, Cordillera, Guairá, Ñeembucú, Paraguarí, San Pedro.

Global distribution. Argentina, Bolivia, Brazil, Paraguay, Uruguay.

Ecology. Subhumid and riparian forests.

Phenology. Flowers throughout the year.

***Grindelia puberula* Hook. & Arn.**

First report. PARAGUAY – Ñeembucú • Pilar, desvío a Guazú Cuá; 26°54′28″S, 058°01′35″W; 22.XI.2022; Soria & Stevens 8366 leg.; FCQ 59834.

Identification. Shrubs branched from the base. Stems decumbent, leafy, pubescent; hairs capitate or simple. Leaves narrowly oblong, acute, regularly serrate, broadened at the base. Capitula radiate, phyllary 3–4-seriate. Florets dimorphic; ray florets pistillate, ligulate, yellow; disk florets numerous, perfect, tubulose, 5-lobed. Cypsela flattened; pappus of 6–10 capillary, ciliate aristae.

Distribution in Paraguay. Alto Paraguay, Ñeembucú.

Global distribution. Argentina, Brazil, Paraguay.

Ecology. Savannahs, grasslands, and prairies.

Phenology. Flowers from September through February.

***Solidago chilensis* Meyen**
Figure 3D

First report. PARAGUAY – Ñeembucú • Camino Pilar – Isla Umbu; 27°01′06″S, 058°13′53″W; 23.XI.2022; Soria & Stevens 8402 leg.; FCQ 59872.

Identification. Herbs, 1–1.5 m tall. Stems erect, densely pubescent. Leaves 4–8 × 0.5–0.8 cm, alternate, linear-lanceolate, entire, 3-nerved, with silky, dense pubescence. Capitula arranged in panicles. Florets dimorphic, yellow; ray florets pistillate, ligulate; disc florets tubulose. Cypsela compressed, pubescent.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Caazapá, Central, Concepción, Cordillera, Guairá, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Brazil, Paraguay.

Ecology. Grasslands, prairies, modified soils, and crop fields.

Phenology. Flowers throughout the year.

***Symphyotrichum graminifolium* (Spreng.) G.L. Nesom**

First report. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°52′07″S, 058°17′36″W; 16.VII.2022; Soria 8322 leg.; FCQ 59791.

Identification. Herbs, 1–1.5 m tall. Stems erect, glabrous. Leaves linear-oblanceolate, acute at the apex, attenuate at the base, entire, glabrous. Capitula arranged in broad panicles. Florets dimorphic; ray florets pistillate, ligulate, white; disc florets yellow, numerous. Cypsela 5-costate, glabrous to sparsely pubescent.

Distribution in Paraguay. Alto Paraguay, Caaguazú, Concepción, Cordillera, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Bolivia, Brazil, Paraguay, Uruguay.

Ecology. Grasslands, prairies, modified soils, and crop fields.

Phenology. Flowers throughout the year.

Tribe Coreopsideae Lindl.

***Bidens pilosa* L.**
Figure 3E

First report. PARAGUAY – Ñeembucú • Camino Pilar – Estancia San Francisco Javier; 26°53′27″S, 058°13′04″W; 26.XI.2022; Soria, Lopez & Stevens 8437 leg.; FCQ 59906.

Identification. Herbs, 0.30–1.20 m tall, branched. Leaves opposite, petiolate, lamina deeply pinnatisect, the segments ovate; apex acuminate, margin serrate, base attenuate. Capitula long pedunculate, arranged in corymbiform cymes. Florets dimorphic; ray florets asexual, ligulate, yellow, sometimes white; disk florets tubulose, yellow. Cypsela linear; pappus of 2–3 aristae covered with rigid, acute, retrorse trichomes.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Caazapá, Canindeyú, Central, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Pantropical.

Ecology. Grasslands, pastures, crop fields, and modified soils.

Phenology. Flowers throughout the year.

***Bidens subalternans* DC.**

First report. PARAGUAY – Ñeembucú • Camino Pilar – Humaitá; 26°53′27″S, 058°19′05″W; 21.XI.2022; Soria & Stevens 8384 leg.; FCQ 59791.

Identification. Herbs, 0.4–1 m tall, branched, sparsely hispid. Leaves opposite, petiolate, lamina deeply bipinnatisect, the segments lanceolate; apex acuminate, margin serrate, base attenuate. Capitula long pedunculate, arranged in corymbiform cymes. Florets dimorphic; ray florets ligulate, yellow, sometimes white; disk florets tubulose. Cypsela linear; pappus of 4 aristae covered with rigid, acute, retrorse trichomes.

Distribution in Paraguay. Alto Paraguay, Amambay, Caaguazú, Caazapá, Central, Cordillera, Guairá, Ñeembucú, Paraguarí.

Global distribution. Argentina, Bolivia, Brazil, Chile, Paraguay, Uruguay.

Ecology. Grasslands, pastures, crop fields, and modified soils.

Phenology. Flowers from September through May.

***Isostigma peucedanifolium* (Spreng.) Less.**

First report. PARAGUAY – Ñeembucú • Pilar, campo propiedad Flia. Silva; 26°51′57″S, 058°16′08″W; 26.XI.2022; Soria, López & Stevens 8452 leg.; FCQ 59921.

Identification. Herbs, 0.5–2 m tall, with xylopodium up to 40 cm. Scapes simple, one to several in each plant, erect, aphyllous or with leaves reduced to bracteoles. Leaves in basal rosette, deeply bipinnatisect; leaflets filiform or subulate, acute, revolute. Capitula radiate, reddish-purple. Florets dimorphic, purple; ray florets pistillate, ligulate; disk florets numerous, perfect, tubulose, 5-lobed. Cypsela with pappus 0–2-aristate.

Distribution in Paraguay. Itapúa, Misiones, Ñeembucú.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Savannahs, grasslands, and prairies.

Phenology. Flowers from November through March.

Tribe Eupatorieae Cass.

***Austroeupatorium inulifolium* (Kunth) R.M. King & H. Rob.**
Figure 3F

First report. PARAGUAY – Ñeembucú • Camino Pilar – Isla Umbu; 27°01′44″S, 058°13′13″W; 23.X.2022; Soria & Stevens 8408 leg.; FCQ 59877.

Identification. Shrubs, 1–2 m tall. Stems erect, densely and shortly pubescent. Leaves opposite, ovate-lanceolate, pubescent-strigose on the adaxial surface, lanuginose on the abaxial surface; apex acute, margin serrate, base decurrent on the petiole. Capitula small, numerous, fragrant, in terminal corymbiform cymes. Florets white. Cypsela black, glabrous, with pappus.

Distribution in Paraguay. Alto Paraná, Amambay, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. South America.

Ecology. Forest edges, grasslands, and prairies. Prefers humid soils.

Phenology. Flowers from October through June.

***Austroeupatorium laetevirens* (Hook. & Arn.) R.M. King & H. Rob.**
Figure 3G

First report. PARAGUAY – Ñeembucú • Camino Pilar – Villa Franca; 26°30′27″S, 058°11′47″W; 25.XI.2022; Soria & Stevens 8428 leg.; FCQ 59897.

Identification. Subshrubs, 1–1.5 m tall, glabrous. Leaves opposite, sessile, narrowly lanceolate to linear, glabrous; apex and base acute, margin sparsely dentate. Capitula small, lax, fragrant, in terminal corymbiform cymes. Involucre bell-shaped, phyllaries oblong, obtuse. Florets white. Cypsela with white pappus.

Distribution in Paraguay. Alto Paraná, Amambay, Caaguazú, Caazapá, Central, Cordillera, Guairá, Misiones, Ñeembucú, Paraguarí.

Global distribution. Argentina, Brazil, Paraguay.

Ecology. On humid, rocky soils.

Phenology. Flowers from November through May.

***Campuloclinium macrocephalum* (Less.) DC.**
Figure 3I

Material examined. PARAGUAY – Ñeembucú • Cercanías de Pilar, Estancia Yberá; 26°47'S, 058°06'W; 25.II.2009; Mereles 9727 leg.; FCQ 48985.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Central and South America.

Ecology. Savannahs and grasslands on sandy, rocky soils.

Phenology. Flowers throughout the year.

***Campuloclinium purpurascens* (Baker) R.M. King & H. Rob.**

First report. PARAGUAY – Ñeembucú • Camino Pilar – San Juan del Ñeembucú; 26°39′38″S, 058°06′14″W; 24.XI.2022; Soria & Stevens 8418 leg.; FCQ 59887.

Identification. Herbs, 1–2 m tall, rhizomatous. Stems hirsute, branched at the top. Leaves opposite, the lower ones ovate-deltoid, the upper ones lanceolate, gradually smaller; petiole narrowly winged. Capitula numerous, in corymbiform cymes. Florets purplish or pinkish. Cypsela 5-costate, slightly pubescent.

Distribution in Paraguay. Alto Paraná, Amambay, Caaguazú, Central, Cordillera, Guairá, Misiones, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay.

Ecology. Wetlands.

Phenology. Flowers from November through May.

***Chromolaena christieana* (Baker) R.M. King & H. Rob.**

First report. PARAGUAY – Ñeembucú • Camino Pilar - Isla Umbu; 27°05′29″S, 058°12′10″W; 23.XI.2022; Soria & Stevens 8410 leg.; FCQ 59879.

Identification. Shrubs, 1–1.5 m tall, lateral branches opposite, pubescent when young, glabrous at maturity, leafy. Leaves opposite, lanceolate, glabrescent; apex attenuate, margin entire to sparsely dentate, base cuneate. Capitula numerous, small, in terminal corymbiform cymes; involucre cylindrical, phyllaries in 5–6 series. Florets purplish. Cypsela black, costate, pubescent; pappus white.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Brazil, Paraguay.

Ecology. Forest clearings and edges.

Phenology. Flowers throughout the year.

***Chromolaena hirsuta* (Hook. & Arn.) R.M. King & H. Rob.**

Material examined. PARAGUAY – Ñeembucú • San Fernando, sobre el río Tebicuary; 26°36'S, 058°07'W; 5.V.1945; Rojas 12634 leg.; SI 043194.

Distribution in Paraguay. Alto Paraguay, Amambay, Caaguazú, Caazapá, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Brazil, Paraguay, Uruguay.

Ecology. Grasslands and prairies.

Phenology. Flowers from December through May.

***Chromolaena ivifolia* (L.) R.M. King & H. Rob.**

First report. PARAGUAY – Ñeembucú • Mburica, campo del Sr. Silva; 26°43′03″S, 058°08′54″W; 21.XI.2022; Soria, López & Stevens 8397; leg.; FCQ 59867.

Identification. Subshrubs, 0.40–1.20 m tall, covered with short, curved hairs. Leaves opposite, rhombic-lanceolate or linear-lanceolate, pubescent; apex acute, margin serrate, base attenuate. Capitula numerous, in lax corymbiform cymes; involucre cylindrical, phyllaries in several series, oblong, truncate, somewhat recurved at apex. Florets purplish. Cypsela glabrous with white pappus.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. North, Central and South America.

Ecology. Grasslands and prairies.

Phenology. Flowers throughout the year.

***Chromolaena orbignyana* (Klatt) R.M. King & H. Rob.**

Material examined. PARAGUAY – Ñeembucú • Cercanías de Pilar, Estancia Yberá; 26°47'S, 058°06'W; 26.II.2009; Mereles 9732 leg.; FCQ 48808.

Distribution in Paraguay. Alto Paraguay, Amambay, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Paraguay.

Ecology. Grasslands and prairies. Prefers sandy soils.

Phenology. Flowers throughout the year.

***Gymnocoronis spilanthoides* (D. Don ex Hook. & Arn.) DC.**
Figure 4A

Material examined. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′35″S, 058°14′17″W; 21.XI.2022; Soria & Stevens 8376 leg.; FCQ 59844.

Distribution in Paraguay. Alto Paraguay, Amambay, Caazapá, Central, Concepción, Cordillera, Itapúa, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. River/stream banks and wetlands.

Phenology. Flowers from November through April.

***Hatschbachiella tweedieana* (Hook. & Arn.) R.M. King & H. Rob.**
Figure 4B

First report. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′43″S, 058°17′14″W; 17.VIII.2022; Soria 8328 leg.; FCQ 59797.

Identification. Subshrubs, 0.30–0.50 m tall, stems erect, branched, densely pubescent, leafy. Leaves opposite, lanceolate or linear-lanceolate; apex acute, margin entire to serrate, base deltoid. Capitula small, arranged in corymbiform cymes, involucre bell-shaped, phyllaries in two series. Florets white or violet. Cypsela densely pubescent; pappus white.

Figure 4. Representative Asteraceae tribes and species documented in Ñeembucú. **A.** Eupatorieae; *Gymnocoronis spilanthoides*. **B.** Eupatorieae; *Hatschbachiella tweedieana*. **C.** Eupatorieae; *Mikania micrantha*. **D.** Eupatorieae; *Praxelis clematidea*. **E.** Eupatorieae; *Urolepis hecatantha*. **F.** Gnaphalieae; *Gamochaeta americana*. **G.** Helenieae; *Hymenoxys anthemoides*. **H.** Heliantheae; *Acmella decumbens*. (Photo credits: A, B: L. Pérez de Molas. C, D, E, F, H: J. De Egea. G: N. Soria).

Distribution in Paraguay. Amambay, Caazapá, Central, Cordillera, Guairá, Misiones, Ñeembucú, Paraguarí, San Pedro.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Grasslands, prairies, and crop fields. Prefers humid and sandy soils.

Phenology. Flowers throughout the year.

***Heterocondylus grandis* (Baker) R.M. King & H. Rob.**

First report. PARAGUAY – Ñeembucú • Mburica, campo del Sr. Silva; 26°43′03″S, 058°08′54″W; 21.XI.2022; Soria, López & Stevens 8396 leg.; FCQ 59866.

Identification. Herbs, 0.50–1 m tall, rhizomatous, densely villous. Leaves opposite, sessile or short petiolate, ovate-rhombic, pubescent; apex acute, margin serrate, base deltoid. Capitula large on terminal corymbiform cymes. Florets pinkish-violet. Cypsela sparsely hirsute.

Distribution in Paraguay. Alto Paraná, Amambay, Caaguazú, Caazapá, Canindeyú, Cordillera, Guairá, Itapúa, Ñeembucú, Paraguarí.

Global distribution. Argentina, Brazil, Paraguay.

Ecology. Forest clearings and edges. Prefers floodable soils.

Phenology. Flowers from November through March.

***Mikania cynanchifolia* Hook. & Arn. ex Baker**

First report. PARAGUAY – Ñeembucú • Camino Pilar – Isla Umbu; 27°01′44″S, 058°13′13″W; 23.XI.2022; Soria & Stevens 8406 leg.; FCQ 59875.

Identification. Vines with hexagonal stems, densely hairy to tomentose, hairs incurved. Leaves triangular-ovate, 5-palmatinerved; apex acuminate, margin undulate, base cordate to semi-hastate, pubescent. Capitula in corymbs. Florets white. Cypsela pentagonal in section, glandular, dark brown to black.

Distribution in Paraguay. Alto Paraguay, Canindeyú, Central, Cordillera, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Wetlands.

Phenology. Flowers from October through December.

***Mikania micrantha* Kunth**
Figure 4C

First report. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′43″S, 058°17′14″W; 21.XI.2022; Soria & Stevens 8382 leg.; FCQ 59852.

Identification. Vines, stems terete to slightly angulate, glabrous. Leaves ovate, 3–5-nerved; apex acute-acuminate, margin entire, sometimes crenulate or dentate, base cordate. Capitula in broad panicles. Florets greenish-white. Cypsela sparsely glandular, blackish.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Caazapá, Canindeyú, Central, Cordillera, Guairá, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. North, Central and South America.

Ecology. River/stream banks, wetlands, and disturbed areas. On humid soils.

Phenology. Flowers throughout the year.

***Mikania periplocifolia* Hook. & Arn.**

Material examined. PARAGUAY – Ñeembucú • Camino Pilar – Isla Umbu; 27°01′44″S, 058°13′13″W; 23.XI.2022; Soria & Stevens 8407 leg.; FCQ 59876.

Distribution in Paraguay. Alto Paraguay, Boquerón, Canindeyú, Central, Cordillera, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Bolivia, Brazil, Paraguay, Uruguay.

Ecology. River/stream banks and wetlands.

Phenology. Flowers throughout the year.

***Praxelis clematidea* (Hieron. ex Kuntze) R.M. King & H. Rob.**
Figure 4D

Material examined. PARAGUAY – Ñeembucú • Camino Pilar – San Juan del Ñeembucú; 26°39′39″S, 058°04′02″W; 24.XI.2022; Soria & Stevens 8421 leg.; FCQ 59890.

Distribution in Paraguay. Alto Paraguay, Amambay, Boquerón, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Bolivia, Brazil, Paraguay.

Ecology. Forests.

Phenology. Flowers throughout the year.

***Praxelis kleinioides* (Kunth) Sch. Bip.**

Material examined. PARAGUAY – Ñeembucú • Yacaré (Guazú Cuá); 26°03'S, 057°25'W; 26.X.1991; Spichiger, Loizeau, Schlüssel & Barriera 5226 leg.; G 00027584.

Distribution in Paraguay. Amambay, Canindeyú, Concepción, Ñeembucú.

Global distribution. South America.

Ecology. River/stream banks and wetlands.

Phenology. Flowers from October through February.

***Praxelis ostenii* (B.L. Rob.) R.M. King & H. Rob.**

Material examined. PARAGUAY – Ñeembucú • Camino Pilar – Mayor Martínez; 27°08′37″S, 058°12′00″W; 23.XI.2022; Soria & Stevens 8414 leg.; FCQ 59883.

Distribution in Paraguay. Amambay, Caaguazú, Central, Concepción, Cordillera, Guairá, Ñeembucú, Paraguarí, San Pedro.

Global distribution. Argentina, Paraguay.

Ecology. Forest edges, grasslands, and prairies. On sandy and clayey soils.

Phenology. Flowers throughout the year.

***Urolepis hecatantha* (DC.) R.M. King & H. Rob.**
Figure 4E

Material examined. PARAGUAY – Ñeembucú • Estancia Redondo; 26°35′17″S, 058°03′31″W; 27.I.2005; Peña-Chocarro, De Egea, Vera & Elsam 2332 leg.; BM 000934280.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Bolivia, Brazil, Paraguay, Uruguay.

Ecology. River/stream banks and wetlands.

Phenology. Flowers throughout the year.

Tribe Gnaphalieae (Cass.) Lecoq. & Juillet

***Gamochaeta americana* (Mill.) Wedd.**
Figure 4F

First report. PARAGUAY – Ñeembucú • Pilar, desvío a Guazú Cuá; 26°53′11″S, 057°58′45″W; 22.XI.2022; Soria & Stevens 8358 leg.; FCQ 59826.

Identification. Herbs, up to 0.6 m. Stems simple, decumbent or ascending, woolly. Leaves oblong-spatulate, discolorous, glabrous to sparsely tomentose on adaxial surface, densely woolly on abaxial surface; apex obtuse to rounded, mucronate, margin entire, base attenuate; basal leaves in rosette, cauline leaves gradually smaller and narrower. Capitula in axillary glomerules forming a compact pseudo-spike. Florets white. Cypsela obovoid; pappus of scabrous, white bristles.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Caazapá, Central, Cordillera, Guairá, Itapúa, Ñeembucú, San Pedro.

Global distribution. Tropical, subtropical and temperate America.

Ecology. Grasslands and prairies. Prefers sandy and rocky soils.

Phenology. Flowers from June through November.

***Gamochaeta simplicicaulis* (Willd. ex Spreng.) Cabrera**

First report. PARAGUAY – Ñeembucú • Camino Pilar – Humaitá; 26°53′27″S, 058°19′05″W; 21.XI.2022; Soria & Stevens 8395 leg.; FCQ 59865.

Identification. Herbs, up to 0.6 m. Stems erect, tomentose. Leaves oblanceolate, distinctly discolorous, sparsely woolly on adaxial surface, densely woolly on abaxial surface; apex acute, mucronate, margin entire, base attenuate. Capitula in axillary glomerules forming a leafy, discontinuous pseudo-spike. Florets white. Cypsela oblong-elliptic, pubescent; pappus of scabrous, white bristles.

Distribution in Paraguay. Alto Paraná, Amambay, Ñeembucú.

Global distribution. South America.

Ecology. Forest edges and clearings, savannahs, and grasslands. Prefers humid soils.

Phenology. Flowers from November through March.

***Micropsis dasycarpa* (Griseb.) Beauverd**

First report. PARAGUAY – Ñeembucú • Pilar, desvío a Guazú Cuá; 26°53′11″S, 057°58′45″W; 22.XI.2022; Soria & Stevens 8357 leg.; FCQ 59825.

Identification. Herbs, 2–6 cm tall. Stems simple, delicate, ascending, leafy towards the upper part. Leaves alternate, sessile, spatulate, densely tomentose on both sides; apex truncate and shortly mucronate. Capitula sessile, axillary; receptacle with paleae, involucre pyriform, phyllaries papery, transparent. Florets yellowish. Cypsela oblong, pubescent; pappus absent.

Distribution in Paraguay. Caaguazú, Central, Cordillera, Misiones, Ñeembucú, Paraguarí.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. River/stream banks and wetlands. Prefers clayey soils.

Phenology. Flowers from November through February.

Tribe Helenieae Lindl.

***Hymenoxys anthemoides* (Juss.) Cass. ex DC.**
Figure 4G

First report. PARAGUAY – Ñeembucú • Pilar, camino a Guazú Cuá; 26°54′03″S, 059°04′23″W; 22.XI.2022; Soria & Stevens 8370 leg.; FCQ 59838.

Identification. Herbs, 0.20–0.50 m tall. Stems decumbent or ascending, leafy, glabrous or puberulent. Leaves alternate, deeply pinnatisect, the segments linear. Capitula axillary and terminal, solitary, discoid, pedunculate; involucre globose. Florets isomorphic, bisexual, yellow. Cypsela turbinate, densely sericeous; pappus paleaceous, palea lanceolate, aristate, membranous.

Distribution in Paraguay. Ñeembucú, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Palm savannahs, grasslands, and prairies. On humid, clayey, brackish soils.

Phenology. Flowers from November through February.

Tribe Heliantheae Cass.

Acmella decumbens* (Sm.) R.K. Jansen var. *decumbens
Figure 4H

Material examined. PARAGUAY – Ñeembucú • Estancia Redondo; 26°35′60″S, 058°03′52″W; 29.X.2004; Peña-Chocarro, De Egea, Torrez & Zarza 2220 leg. FCQ 56275.

Distribution in Paraguay. Alto Paraguay, Amambay, Ñeembucú, Paraguarí.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Savannahs, grasslands, and prairies. On humid soils.

Phenology. Flowers from June through November.

***Acmella glaberrima* (Hassl.) R.K. Jansen**

First report. PARAGUAY – Ñeembucú • Camino Pilar – Estancia San Francisco Javier; 26°54′05″S, 058°22′24″W; 26.XI.2022; Soria, López & Stevens 8445 leg.; FCQ 59914.

Identification. Herbs, 0.15–0.30 m tall. Stems erect or ascending, glabrous to sparsely strigose. Leaves opposite, linear to lanceolate, glabrous; apex acute, margin entire to denticulate, base attenuate. Capitula solitary, peduncles 5–15 cm, ascending. Florets dimorphic, yellow; ray florets pistillate, ligulate; disk florets perfect, tubulose, 5-lobed. Cypsela oblong, sparsely ciliate; pappus of 2 short aristae or absent.

Distribution in Paraguay. Amambay, Caazapá, Central, Concepción, Itapúa, Misiones, Ñeembucú, Presidente Hayes, San Pedro.

Global distribution. Argentina, Chile, Paraguay.

Ecology. Savannahs, grasslands, and prairies.

Phenology. Flowers from October through February.

***Acmella pusilla* (Hook. & Arn.) R.K. Jansen**

First report. PARAGUAY – Ñeembucú • Camino Pilar – Isla Umbu; 27°01′06″S, 058°13′53″W; 23.XI.2022; Soria & Stevens 8405 leg.; FCQ 59874.

Identification. Herbs, stems decumbent, 0.15–0.30 m long, rooting at nodes, glabrescent. Leaves opposite, oblanceolate; apex acute to obtuse, margin ciliate, entire, sinuate or sparsely dentate, base attenuate. Capitula solitary, peduncles 4–10 cm, ascending. Florets dimorphic, yellow; ray florets pistillate, ligulate; disk florets perfect, tubulose, 5-lobed. Cypsela oblong, dorsally compressed, with ciliate margins; pappus of 2 short aristae or absent.

Distribution in Paraguay. Amambay, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Savannahs, grasslands, and prairies. On humid soils.

Phenology. Flowers throughout the year.

***Ambrosia artemisiifolia* L.**
Figure 5A

First report. PARAGUAY – Ñeembucú • Camino Pilar – Humaitá; 26°53′27″S, 058°19′05″W; 21.XI.2022; Soria & Stevens 8334 leg.; FCQ 59856.

Identification. Herbs, 0.50–1 m tall; stems erect, branched, pubescent. Leaves alternate; lower leaves deeply bipinnatisect, the segments lanceolate; upper leaves lanceolate, entire or basally lobed. Capitula in terminal racemes, the staminate ones shortly stalked, nutant; the pistilate capitula congested in the lower part of the inflorescence, surrounded by bracts. Staminate florets tubulose, 5-lobed; pistillate florets naked. Cypsela obovoid, included in the persistent involucre; short beak with 4 prominent tips.

Distribution in Paraguay. Alto Paraná, Amambay, Boquerón, Caazapá, Central, Concepción, Cordillera, Guairá, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Tropical and subtropical America.

Ecology. River/stream banks and wetlands.

Phenology. Flowers throughout the year.

***Aspilia montevidensis* (Spreng.) Kuntze**
Figure 5B

First report. PARAGUAY – Ñeembucú • Camino Pilar – Humaitá; 26°53′27″S, 058°19′05″W; 21.XI.2022; Soria & Stevens 8392 leg.; FCQ 59862.

Identification. Herbs, 0.20–0.40 m tall; stems repent or ascending, densely hispid-pubescent. Leaves opposite, sessile, lanceolate; apex acute, margin entire to crenulate-serrate, base attenuate. Capitula radiate, terminal, solitary. Florets dimorphic, yellow; ray florets neuter, ligulate; disk florets perfect, tubulose, 5-lobed. Cypsela oblong, densely villous; pappus consisting of a coronet of welded scales and 2–3 short aristae.

Distribution in Paraguay. Amambay, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Forest edges and clearings, grasslands, and prairies.

Phenology. Flowers throughout the year.

***Aspilia pascalioides* Griseb.**
Figure 5C

Material examined. PARAGUAY – Ñeembucú • Camino Pilar – San Juan del Ñeembucú; 26°40′26″S, 057°52′23″W; 24.XI.2022; Soria & Stevens 8423 leg.; FCQ 59830.

Distribution in Paraguay. Alto Paraná, Amambay, Cordillera, Guairá, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Forest edges and clearings.

Phenology. Flowers throughout the year.

***Aspilia silphioides* (Hook. & Arn.) Benth. ex Baker**

Material examined. PARAGUAY – Ñeembucú • Cercanías de Pilar, Estancia Yberá; 26°47'S, 058°06'W; 26.II.2009; Mereles 9729 leg.; FCQ 48839.

Distribution in Paraguay. Amambay, Central, Cordillera, Guairá, Ñeembucú, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Riparian forests, grasslands, and proximate to wetlands.

Phenology. Flowers throughout the year.

Figure 5. Representative Asteraceae tribes and species documented in Ñeembucú. **A.** Heliantheae; *Ambrosia artemisiifolia*. **B.** Heliantheae; *Aspilia montevidensis*. **C.** Heliantheae; *Aspilia pascalioides*. **D.** Heliantheae; *Eclipta prostrata*. **E.** Heliantheae; *Melanthera latifolia*. **F.** Heliantheae; *Xanthium spinosum* var. *spinosum*. **G.** Inuleae; *Pluchea sagittalis*. **H.** Inuleae; *Pterocaulon purpurascens*. **I.** Inuleae; *Pterocaulon virgatum*. (Photo credits: A–E: J. De Egea. F, G, I: N. Soria. H: L. Pérez de Molas).

***Eclipta prostrata* (L.) L.**
Figure 5D

First report. PARAGUAY – Ñeembucú • Pilar, desvío a Guazú Cuá; 26°53′05″S, 057°00′14″W; 22.XI.2022; Soria & Stevens 8363 leg.; FCQ 59831.

Identification. Herbs, erect or ascending, laxly pubescent. Leaves opposite, sessile, oblong-lanceolate; apex acute, margin entire or serrate. Capitula solitary or geminate, axillary, pedunculated. Florets white, the ray ones with short linear ligule. Cypsela trigonal or tetragonal, rugose; pappus consisting of a coronet of very short bristles.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Canindeyú, Central, Concepción, Cordillera, Guairá, Misiones, Ñeembucú, Presidente Hayes, San Pedro.

Global distribution. Pantropical.

Ecology. Grasslands, pastures, crop fields, and disturbed areas. Prefers humid and floodable soils.

Phenology. Flowers throughout the year.

***Melanthera latifolia* (Gardner) Cabrera**
Figure 5E

First report. PARAGUAY – Ñeembucú • Camino Pilar – Villa Franca; 26°31′44″S, 058°11′27″W; 25.XI.2022; Soria & Stevens 8426 leg.; FCQ 59895.

Identification. Herbs, 0.50–1.50 m tall, stems adpressed-hispid. Leaves opposite, petiolate, broadly ovate, hispid; apex acuminate, margin irregularly dentate, base rounded and slightly decurrent. Capitula axillary, solitary, long stalked. Florets dimorphic, yellow; ray florets ligulate; disc florets tubulose. Cypsela tetragonal, pubescent at apex; pappus of unequal, deciduous bristles.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caazapá, Canindeyú, Central, Guairá, Ñeembucú, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Forest edges and clearings.

Phenology. Flowers throughout the year.

***Sphagneticola brachycarpa* (Baker) Pruski**

Material examined. PARAGUAY – Ñeembucú • Camino Pilar – Villa Franca; 26°30′27″S, 058°11′47″W; 25.XI.2022; Soria & Stevens 8431 leg.; FCQ 59900.

Distribution in Paraguay. Central, Concepción, Cordillera, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay.

Ecology. Riparian forests, floodable savannahs and grasslands, and proximate to wetlands.

Phenology. Flowers throughout the year.

***Verbesina subcordata* DC.**

First report. PARAGUAY – Ñeembucú • Pilar, desvío a Guazú Cuá; 26°54′40″S, 058°02′35″W; 22.XI.2022; Soria & Stevens 8368 leg.; FCQ 59836.

Identification. Subshrubs, 1–2 m tall, branched, pubescent. Leaves alternate, sessile, lanceolate, laxly pubescent on the adaxial surface and velutinous-pubescent on the abaxial surface; apex acute, margin serrate, base attenuate and semi-auriculate. Capitula in terminal corymbiform cymes. Florets dimorphic, yellow; ray florets ligulate; disc florets tubulose. Cypsela winged, glabrous or slightly pubescent; pappus consisting of two aristae.

Distribution in Paraguay. Amambay, Caazapá, Canindeyú, Central, Concepción, Cordillera, Itapúa, Ñeembucú, Paraguarí.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Grasslands, prairies, and modified soils.

Phenology. Flowers throughout the year.

***Wedelia subvaginata* N.E.Br.**

First report. PARAGUAY – Ñeembucú • Camino Pilar – Villa Franca; 26°30′27″S, 058°11′47″W; 25.XI.2022; Soria & Stevens 8430 leg.; FCQ 59899.

Identification. Herbs, 0.30–0.60 m tall, rhizomatous; stems erect, simple, strigose. Leaves opposite, petiolate, elliptic or elliptic-lanceolate, strigose-pubescent on both sides; apex acute or obtuse, margin serrate, base rounded or cuneate. Capitula radiate, solitary, peduncles 4–10 cm. Florets dimorphic, yellow; ray florets ligulate; disc florets tubulose. Cypsela obovoid, glabrous; pappus consisting of a coronet of very short scales.

Distribution in Paraguay. Central, Cordillera, Ñeembucú, Presidente Hayes.

Global distribution. Argentina, Paraguay.

Ecology. Savannahs, grasslands, and prairies. Prefers humid soils.

Phenology. Flowers throughout the year.

Xanthium spinosum* L. var. *spinosum
Figure 5F

First report. PARAGUAY – Ñeembucú • Camino Pilar – Estancia San Francisco Javier; 26°53′27″S, 058°13′04″W; 26.XI.2022; Soria, López & Stevens 8440 leg.; FCQ 59909.

Identification. Herbs, 0.50–1 m tall. Stems erect, branched, lanuginous or glabrous, with long yellow trifid spines at the base of the leaves. Leaves alternate, shortly petiolate, lanceolate, sparsely pubescent on adaxial surface, densely albo-tomentose on abaxial surface; apex acute, margin entire or with one or two lobes on each side, base attenuate. Staminate capitula globose, in terminal spikes; pistillate capitula axillary, involucre covered with hooked spines with two apical faces of unequal length. Staminate florets tubulose, 5-lobed; pistillate florets naked. Cypsela included in the involucre, covered by hooked spines.

Distribution in Paraguay. Alto Paraguay, Boquerón, Caaguazú, Central, Cordillera, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Native to South America, introduced to other continents and considered invasive.

Ecology. Disturbed areas and crop fields.

Phenology. Flowers from August through May.

***Xanthium strumarium* L.**

First report. PARAGUAY – Ñeembucú • Camino Pilar – San Juan del Ñeembucú; 26°43′22″S, 057°45′37″W; 24.XI.2022; Soria & Stevens 8424 leg.; FCQ 59893.

Identification. Herbs, 1–2 m tall. Stems erect, branched, harsh. Leaves alternate, long petiolate, ovate-triangular; apex acute, margin irregularly crenate, base cordate. Staminate capitula globose, involucre of linear bracts; pistillate capitula ovoid, involucre covered with hooked spines with two apical beaks. Staminate florets tubulose, 5-lobed; pistillate florets naked. Cypsela included in the involucre, covered by hooked spines.

Distribution in Paraguay. Central, Guairá, Ñeembucú, Paraguarí.

Global distribution. Native to South America, introduced to other continents and considered invasive.

Ecology. Disturbed areas and crop fields.

Phenology. Flowers from August through May.

Tribe Inuleae Cass.

***Pluchea sagittalis* (Lam.) Cabrera**
Figure 5G

First report. PARAGUAY – Ñeembucú • Camino Pilar – Isla Umbú; 27°01′06″S, 058°13′53″W; 23.XI.2022; Soria & Stevens 8400 leg.; FCQ 59870.

Identification. Herbs, 0.30–1 m tall. Stems erect, winged, covered with glandular hairs. Leaves sessile, lanceolate, both sides with glandular and non-glandular hairs; apex acute, margin shortly dentate, base attenuate and decurrent. Capitula in terminal cymes, involucre hemispherical. Florets dimorphic, whitish; ray florets pistillate, filiform; disk florets staminate, tubulose, 5-lobed. Cypsela with glandular hairs; pappus of simple bristles fused at the base.

Distribution in Paraguay. Alto Paraguay, Amambay, Boquerón, Caaguazú, Caazapá, Central, Concepción, Cordillera, Guairá, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Palm savannahs, grasslands, and wetlands.

Phenology. Flowers throughout the year.

***Pterocaulon lorentzii* Malme**

Material examined. PARAGUAY – Ñeembucú • Estancia Redondo; 26°34′31″S, 058°02′27″W; 23.I.2005; Peña-Chocarro, De Egea, Vera & Elsam 2326 leg.; BM 000934406.

Distribution in Paraguay. Amambay, Central, Cordillera, Guairá, Itapúa, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Bolivia, Brazil, Paraguay, Uruguay.

Ecology. Savannahs, grasslands, and prairies. On humid, sandy soils.

Phenology. Flowers from November through May.

***Pterocaulon purpurascens* Malme**
Figure 5H

First report. PARAGUAY – Ñeembucú • Camino Pilar – Villa Franca; 26°31′44″S, 058°11′27″W; 25.XI.2022; Soria & Stevens 8425a leg.; FCQ 59896.

Identification. Herbs, 0.50–1 m tall. Rhizomes horizontal, stems erect, winged, densely tomentose. Leaves alternate, lower leaves obovate, upper leaves linear-elliptic, margin entire, base attenuate, distinctively discolorous, dark on the adaxial surface, densely tomentose on the abaxial surface. Capitula in terminal, ovoid, dense spikes; involucre cylindrical, phyllaries purpurescent at the apex. Florets white with purpurescent apex. Cypsela glandular and villous; pappus white.

Distribution in Paraguay. Alto Paraguay, Boquerón, Central, Concepción, Cordillera, Ñeembucú, Presidente Hayes.

Global distribution. Argentina, Bolivia, Brazil, Paraguay.

Ecology. Savannahs, grasslands, prairies, and disturbed areas. On humid, floodable, clayey soils.

Phenology. Flowers from August through May.

***Pterocaulon rugosum* Malme**

First report. PARAGUAY – Ñeembucú • Pilar; 26°57′07″S, 058°17′36″W; 17.V.2022; Soria & Stevens 8344 leg.; FCQ 59812.

Identification. Herbs, 0.50–1 m tall. Rhizomes globose, stems erect, winged, densely tomentose. Leaves alternate, ovate-elliptic, distinctively discolorous, dark on the adaxial surface, densely woolly on the abaxial surface; apex acute, mucronate, margin crenate, base attenuate. Capitula in terminal, dense, spherical spikes; involucre cylindrical, phyllaries lanuginous. Florets white. Cypsela glandular and villous; pappus white.

Distribution in Paraguay. Amambay, Central, Ñeembucú, Presidente Hayes, San Pedro.

Global distribution. Tropical and subtropical South America.

Ecology. Grasslands and prairies. On sandy soils.

Phenology. Flowers from March through November.

***Pterocaulon virgatum* (L.) DC.**
Figure 5I

First report. PARAGUAY – Ñeembucú • Camino Pilar – San Juan del Ñeembucú; 26°47′01″S, 057°41′26″W; 24.XI.2022; Soria & Stevens 8425 leg.; FCQ 59894.

Identification. Herbs, 0.40–1 m tall. Rhizomes globose, stems erect, winged, densely tomentose. Leaves alternate, lower leaves oblanceolate, upper leaves linear-elliptic; apex acute, margin revolute, entire or slightly serrate, base attenuate; distinctively discolorous, dark on the adaxial surface, densely tomentose on the abaxial surface. Capitula in terminal, elongate, lax spikes; involucre cylindrical, phyllaries lanuginous. Florets white. Cypsela glandular and villous; pappus white.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Misiones, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Tropical and subtropical America.

Ecology. Savannahs, grasslands, prairies, and disturbed areas. Prefers clayey soils.

Phenology. Flowers from October through March.

***Tessaria dodoneifolia* (Hook. & Arn.) Cabrera subsp. *plucheoides* (Hassl.) S.E. Freire**
Figure 6A

First report. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′43″S, 058°17′14″W; 17.VIII.2022; Soria 8321 leg.; FCQ 59790.

Identification. Shrubs, 2–3 m tall. Stems erect, striate, glabrous, viscid. Leaves sessile, lanceolate, covered with glandular hairs, lustrous; apex acute, margin serrate-dentate, base attenuate into a pseudo-petiole. Capitula in corymbiform cymes. Florets dimorphic, pinkish-violet; ray florets ca. 120, filiform; disc florets 6–12, tubulose. Cypsela sparsely pubescent; pappus of simple bristles.

Distribution in Paraguay. Central, Ñeembucú, Presidente Hayes.

Global distribution. Endemic to Paraguay.

Ecology. Banks of the Paraguay River. On clayey, saline soils.

Phenology. Flowers from August through May.

Figure 6. Representative Asteraceae tribes and species documented in Ñeembucú. **A.** Inuleae; *Tessaria dodoneifolia* subsp. *plucheoides*. **B.** Inuleae; *Tessaria integrifolia*. **C.** Millerieae; *Acanthospermum australe*. **D.** Millerieae; *Acanthospermum hispidum*. **E.** Millerieae; *Tridax procumbens*. **F.** Neurolaeneae; *Enydra anagallis*. **G.** Senecioneae; *Erechtites hieraciifolius* var. *cacalioides*. **H.** Senecioneae; *Pseudogynoxys benthamii*. **I.** Senecioneae; *Senecio pterophorus*. (Photo credits: A: N. Soria. B: L. Pérez de Molas. C–I: J. De Egea).

***Tessaria integrifolia* Ruiz & Pav.**
Figure 6B

Material examined. PARAGUAY – Ñeembucú • Carretera a Pilar; 26°52'S, 057°55'W; 22.I.2005; Peña-Chocarro, De Egea, Vera & Elsam 2281 leg.; BM 000934389.

Distribution in Paraguay. Alto Paraguay, Boquerón, Central, Ñeembucú, Presidente Hayes.

Global distribution. South America.

Ecology. River banks.

Phenology. Flowers from August through May.

Tribe Millerieae Lindl.

***Acanthospermum australe* (Loefl.) Kuntze**
Figure 6C

First report. PARAGUAY – Ñeembucú • Pilar, campo propiedad Flia. Silva; 26°51′57″S, 058°16′08″W; 26.XI.2022; Soria, López & Stevens 8460 leg.; FCQ 59928.

Identification. Herbs, stems decumbent to ascending, pubescent. Leaves opposite, petiolate, rhombic-ovate; apex acute or obtuse, margin serrate-dentate, base rounded to attenuate. Capitula solitary, axillary and terminal, pedunculate; involucre campanulate. Florets yellowish-white. Cypsela fusiform, covered with hooked bristles.

Distribution in Paraguay. Alto Paraná, Amambay, Boquerón, Caaguazú, Caazapá, Canindeyú, Central, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Tropical and subtropical America; introduced to other continents.

Ecology. Grasslands, prairies, crop fields, and disturbed areas. Prefers sandy soils.

Phenology. Flowers throughout the year.

***Acanthospermum hispidum* DC.**
Figure 6D

Material examined. PARAGUAY – Ñeembucú • Humaitá, Curupayty; 27°09'S, 058°37'W; 11.XI.1978; Bernardi 18505 leg.; G 00107357.

Distribution in Paraguay. Alto Paraguay, Amambay, Boquerón, Central, Concepción, Cordillera, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Tropical and subtropical America.

Ecology. Grasslands, prairies, crop fields, and disturbed areas. Prefers sandy soils.

Phenology. Flowers throughout the year.

***Tridax procumbens* L.**
Figure 6E

First report. PARAGUAY – Ñeembucú • Pilar; 26°57′07″S, 058°17′36″W; 16.III.2022; Soria 8323 leg.; FCQ 59792.

Identification. Herbs with prostrate to ascending, hirsute stems. Leaves opposite, petiolate, ovate-lanceolate; apex acute, margin dentate, base attenuate. Capitula solitary, long pedunculated. Florets dimorphic, yellow; ray florets pistillate, ligulate, tridentate at apex; disc florets tubulose. Cypsela obconical, hairy; pappus white.

Distribution in Paraguay. Boquerón, Central, Ñeembucú, San Pedro.

Global distribution. Tropical and subtropical America.

Ecology. Modified soils, disturbed areas, and crop fields.

Phenology. Flowers throughout the year.

Tribe Neurolaeneae Rydb.

Calea uniflora* Less. var. *uniflora

First report. PARAGUAY – Ñeembucú • Pilar, campo propiedad Flia. Silva; 26°51′57″S, 058°16′08″W; 26.XI.2022; Soria, López & Stevens 8457 leg.; FCQ 59925.

Identification. Herbs, 0.20–0.40 cm tall, with xylopodium. Stems ascending, few branched at the base, leafy in the lower half, hirsute. Leaves opposite, sessile or subsessile, ovate, pubescent or hirsute; apex acute, margin serrate, base rounded or cuneate. Capitula radiate, terminal, solitary, long stalked. Florets dimorphic, yellow; ray florets ligulate; disc florets tubulose. Cypsela turbinate, black or brown, pubescent; pappus consisting of membranous, linear-lanceolate straws.

Distribution in Paraguay. Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, San Pedro.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Savannahs, grasslands, and prairies. On sandy soils.

Phenology. Flowers from October through May.

***Enydra anagallis* Gardner**
Figure 6F

Material examined. PARAGUAY – Ñeembucú • Camino Pilar – San Juan del Ñeembucú; 26°39′37″S, 057°57′36″W; 24.XI.2022; Soria & Stevens 8422 leg.; FCQ 59891.

Distribution in Paraguay. Boquerón, Central, Cordillera, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Wetlands.

Phenology. Flowers from October through February.

Tribe Senecioneae Cass.

***Erechtites hieraciifolius* (L.) Raf. ex DC. var. *cacalioides* (Fisch. ex Spreng.) Griseb.**

Figure 6G

First report. PARAGUAY – Ñeembucú • Camino Pilar – Isla Umbu; 27°01′06″S, 058°13′53″W; 23.XI.2022; Soria & Stevens 8403 leg.; FCQ 59873.

Identification. Herbs, 0.4–1 m tall, pubescent or glabrescent. Stems erect, simple or branched at the top. Leaves sessile, lower leaves obovate, apex acute, margin sinuate-dentate, base attenuate in pseudo-petiole; upper leaves lanceolate, dentate, semi-clasping. Capitula in terminal, dense, corymbiform cymes; involucre cylindrical with bracts forming a calyculus. Florets white or yellowish. Cypsela 10-costate; pappus white.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Tropical America and Asia.

Ecology. River/stream banks and wetlands.

Phenology. Flowers throughout the year.

***Pseudogynoxys cabrerae* H. Rob. & Cuatrec.**

Figure 6H

Material examined. PARAGUAY – Ñeembucú • Humaitá; 27°04′20″S, 058°30′30″W; 12.XII.1950; Schulz 7780 leg.; G 00093142.

Distribution in Paraguay. Alto Paraná, Caaguazú, Caazapá, Central, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Bolivia, Brazil, Paraguay.

Ecology. Forests.

Phenology. Flowers from August through May.

***Senecio pterophorus* DC.**

Figure 6I

Material examined. PARAGUAY – Ñeembucú • Camino Pilar – Humaitá; 26°53′27″S, 058°19′05″W; 21.XI.2022; Soria & Stevens 8391 leg.; FCQ 59861.

Distribution in Paraguay. Alto Paraguay, Amambay, Caaguazú, Caazapá, Canindeyú, Central, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. River/stream banks and wetlands. Prefers sandy soils.

Phenology. Flowers from August through May.

Tribe Tageteae Cass.

***Porophyllum lanceolatum* DC.**

First report. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′43″S, 058°17′14″W; 17.VIII.2022; Soria 8333 leg.; FCQ 59802.

Identification. Herbs, 0.40–0.80 m tall, erect, glabrous. Leaves alternate, petiolate, lanceolate, with oleiferous glands; apex acute, margin entire to slightly wavy, base attenuate. Capitula numerous, long pedunculate, involucre cylindrical with oleiferous glands. Florets purplish. Cypsela linear, ridged, pubescent; pappus yellowish-white.

Distribution in Paraguay. Boquerón, Cordillera, Guairá, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Forest edges and clearings, savannahs, grasslands, and prairies.

Phenology. Flowers throughout the year.

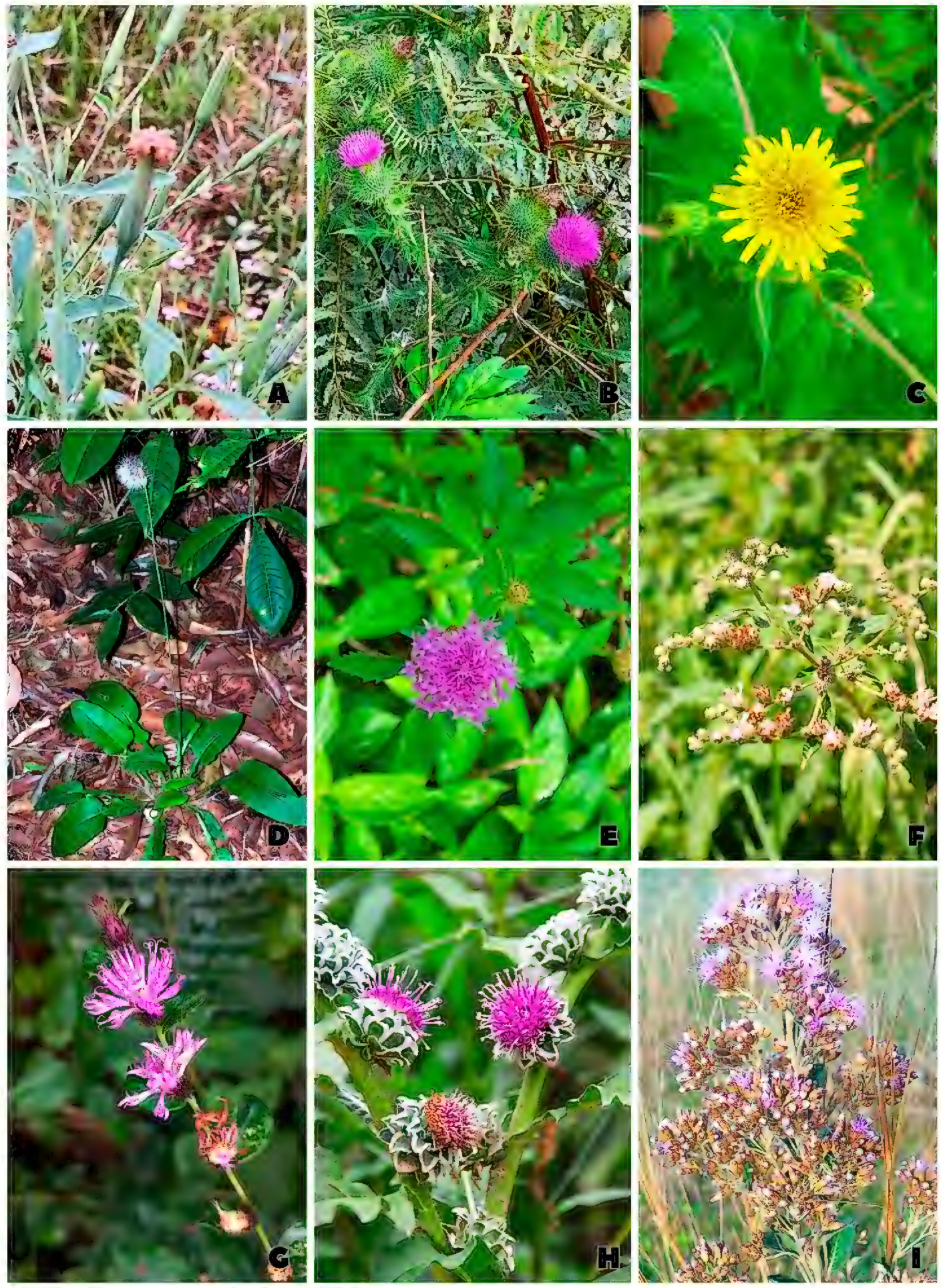

Figure 7. Representative Asteraceae tribes and species documented in Ñeembucú. **A.** Tageteae; *Porophyllum ruderale*. **B.** Cardueae; *Carduus acanthoides* subsp. *acanthoides*. **C.** Cichorieae; *Sonchus oleraceus*. **D.** Mutisieae; *Chaptalia nutans*. **E.** Vernonieae; *Centratherum punctatum*. **F.** Vernonieae; *Cyrtocymura scorpioides*. **G.** Vernonieae; *Lepidaploa remotiflora*. **H.** Vernonieae; *Pacourina edulis*. **I.** Vernonieae; *Vernonanthura chamaedrys*. (Photo credits: A, B: N. Soria. C–E, G, I: J. De Egea. F, H: L. Pérez de Molas).

***Porophyllum ruderale* (Jacq.) Cass.**
Figure 7A

First report. PARAGUAY – Ñeembucú • Camino Pilar – Estancia San Francisco Javier; 26°53′27″S, 058°13′04″W; 26.XI.2022; Soria, López & Stevens 8439 leg.; FCQ 59908.

Identification. Herbs, 0.50–1 m tall, erect, glaucous, glabrous. Leaves opposite and alternate, petiolate, ovate, elliptical; apex acute, margin entire to crenate with oleiferous glands, base attenuate. Capitula solitary, numerous, long pedunculate, involucre cylindrical with linear oleiferous glands. Florets yellowish. Cypsela linear, ridged, pubescent; pappus white.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Caazapá, Canindeyú, Central, Cordillera, Guairá, Itapúa, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Tropical America.

Ecology. Forest edges and clearings, savannahs, grasslands, prairies, disturbed areas, and crop fields.

Phenology. Flowers throughout the year.

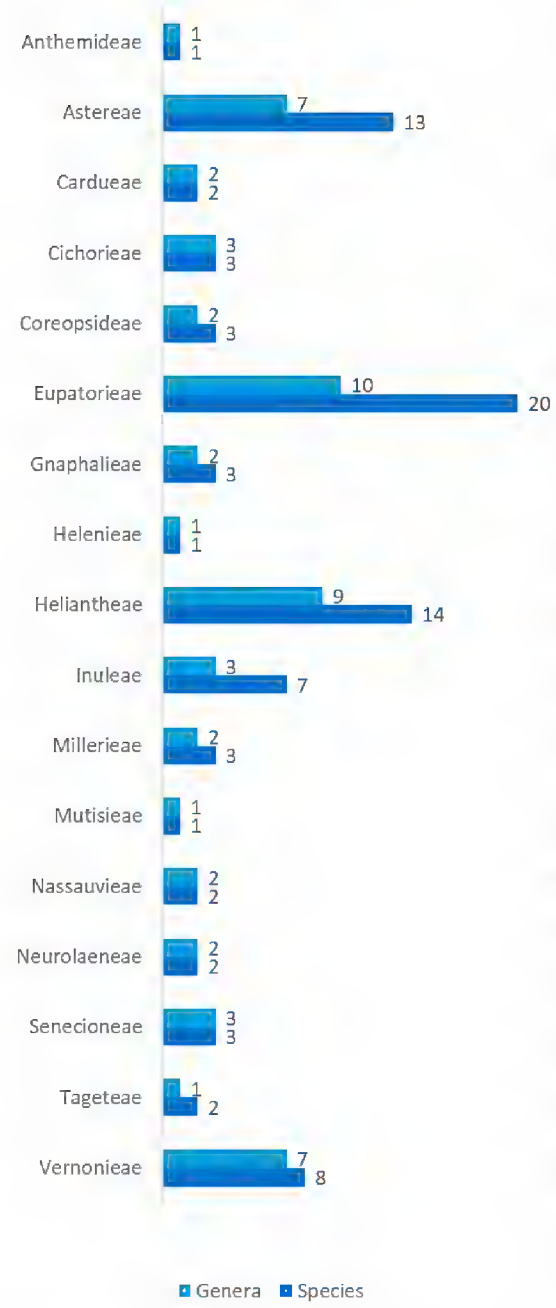

Figure 8. Tribes of Asteraceae present in Ñeembucú showing number of genera and species.

Subfamily Carduoideae Cass. ex Sweet
Tribe Cardueae Cass.

Carduus acanthoides* L. subsp. *acanthoides
Figure 7B

First report. PARAGUAY – Ñeembucú • Pilar, desvío a Guazú Cuá; 26°53′05″S, 057°00′14″W; 22.XI.2022; Soria & Stevens 8365 leg.; FCQ 59833.

Identification. Herbs, 1.5 to 2 m tall. Stems erect, glabrous, with narrow, spine-like, recurved wings. Leaves pinnatifid, with long lanceolate, spiny segments. Capitula shortly pedunculate; involucre globose, bracts linear-subulate, spiny. Florets isomorphic, perfect, tubulose-bilabiate, deeply 5-lobed, red to purple. Cypsela compressed, striate, yellowish; pappus of simple, white bristles.

Distribution in Paraguay. Ñeembucú.

Global distribution. Native to Old Word (Europe and Asia), introduced to South America.

Ecology. Grasslands, pastures, crop fields, and modified soils.

Phenology. Flowers from November through February.

Cirsium vulgare* (Savi) Ten. subsp. *vulgare

Material examined. PARAGUAY – Ñeembucú • Estancia Redondo; 26°35′17″S, 058°03′31″W; 23.I.2005; Peña-Chocarro, De Egea, Vera & Elsam 2308 leg.; FCQ 49282.

Distribution in Paraguay. Caazapá, Ñeembucú.

Global distribution. Native to North America, introduced to South America.

Ecology. Grasslands, pastures, crop fields, and modified soils.

Phenology. Flowers from November through February.

Subfamily Cichorioideae Chevall.
Tribe Cichorieae Lam. & DC.

***Hypochaeris chillensis* (Kunth) Britton**

Material examined. PARAGUAY – Ñeembucú • Estancia Redondo; 26°35′60″S, 058°03′52″W; 29.X.2004; Peña-Chocarro, De Egea, Torres & Zarza 2207 leg.; FCQ 49284.

Distribution in Paraguay. Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Guairá, Misiones, Ñeembucú, Paraguarí.

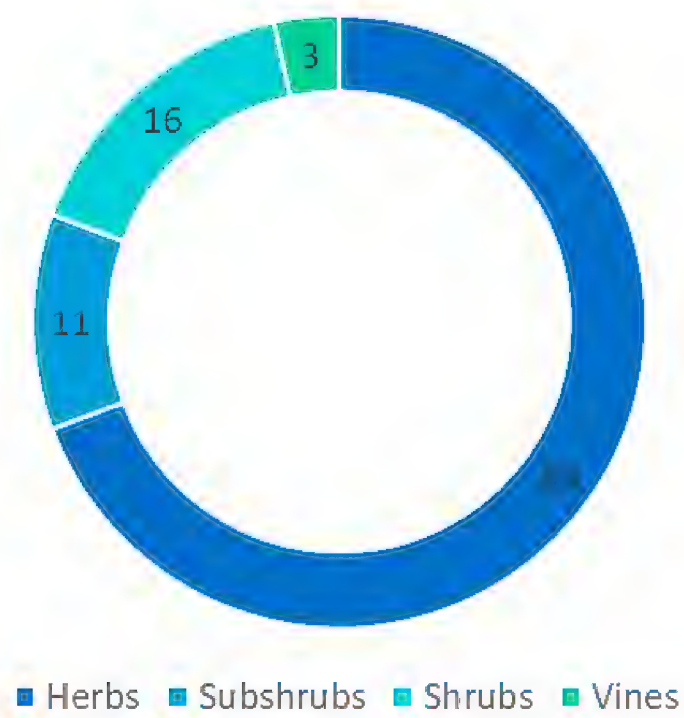

Figure 9. Life forms of the Asteraceae species of Ñeembucú (in percentages).

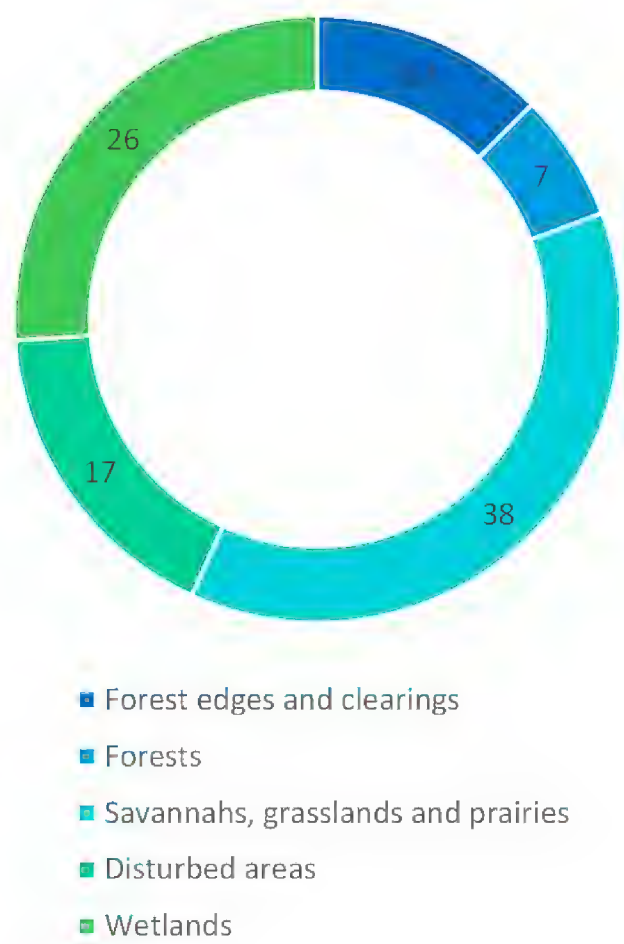

Figure 10. Vegetation types occupied by the Asteraceae species of Ñeembucú (in percentages).

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Savannahs, grasslands, and prairies.

Phenology. Flowers from October through February.

***Picrosia longifolia* D. Don**

Material examined. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′35″S, 058°14′17″W; 21.XI.2022; Soria & Stevens 8380 leg.; FCQ 59849.

Distribution in Paraguay. Alto Paraguay, Central, Guaira, Ñeembucú, Presidente Hayes, San Pedro.

Global distribution. South America.

Ecology. Savannahs, grasslands, and prairies.

Phenology. Flowers throughout the year.

***Sonchus oleraceus* L.**
Figure 7C

First report. PARAGUAY – Ñeembucú • Camino Pilar – Estancia San Francisco Javier; 26°53′27″S, 058°13′04″W; 26.XI.2022; Soria, López & Stevens 8438 leg.; FCQ 59907.

Identification. Herbs, 0.50–1 m tall. Stems erect, glabrous. Lower leaves runcinate, attenuate at the base in a semi-clinging petiole; upper leaves acute, sessile and semi-clinging at the base. Capitula in terminal corymbiform cymes, long stalked. Involucre bell-shaped, glabrous or slightly lanuginous. Florets isomorphic, perfect, ligulate, yellow. Cypsela compressed, multi-costulate; pappus of simple, white hairs.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Boquerón, Caazapá, Canindeyú, Central, Guairá, Ñeembucú, San Pedro.

Global distribution. Native to Europe, introduced to South America.

Ecology. Grasslands, pastures, crop fields, and modified soils.

Phenology. Flowers from November through February.

Subfamily Mutisioideae (Cass.) Lindl.
Tribe Mutisieae Cass.

***Chaptalia nutans* (L.) Pol.**
Figure 7D

First report. PARAGUAY – Ñeembucú • Pilar; 26°51′25″S, 058°18′14″W; 17.V.2022; Soria 8340 leg.; FCQ 59808.

Identification. Acaulescent herbs. Scapes 10–40 cm tall, slender, tomentose. Leaves lyrate-pinnatifid, the terminal lobe large, ovate, crenate to sinuate-dentate; adaxial surface glabrous, abaxial surface densely tomentose. Capitula solitary, nutant when young, later erect. Florets numerous, white or pink. Cypsela fusiform, 5–6-costate, with long beak; pappus white.

Distribution in Paraguay. Alto Paraná, Amambay, Caaguazú, Caazapá, Canindeyú, Central, Cordillera, Guairá, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Tropical and subtropical America.

Ecology. Forests.

Phenology. Flowers throughout the year.

Tribe Nassauvieae Cass.

***Holocheilus hieracioides* (D. Don) Cabrera**

First report. PARAGUAY – Ñeembucú • Camino Pilar – Villa Franca; 26°30′27″S, 058°11′47″W; 25.XI.2022; Soria & Stevens 8429 leg.; FCQ 59829.

Identification. Herbs, 0.10–0.50 m tall, ascending, glabrous or slightly papillose-scabrous. Basal leaves in rosette, obovate, oblanceolate or spatulate; apex acute or obtuse, margin sinuate-dentate and ciliate, base attenuate; cauline leaves few, gradually smaller and narrower, sessile, semi-clasping. Capitula in lax corymbiform cymes. Florets white. Cypsela densely pubescent; pappus white.

Distribution in Paraguay. Alto Paraguay, Boquerón, Central, Itapúa, Ñeembucú, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Forests, forest edges and clearings, grasslands, and prairies. Prefers humid soils.

Phenology. Flowers from August through May.

***Trixis antimenorrhoea* (Schrank) Kuntze**

First report. PARAGUAY – Ñeembucú • Pilar, campo propiedad Flia. Silva; 26°51′57″S, 058°16′08″W; 19.X.2022; Soria & Stevens 8353 leg.; FCQ 59821.

Identification. Subshrubs. Leaves alternate, sessile or subsessile, lanceolate to oblong, pubescent on the adaxial surface, lanuginous on the abaxial surface; apex acute, margin entire or finely dentate, base auriculate and semi-clasping. Capitula in cymes, involucre cylindrical. Florets yellow. Cypsela fusiform, covered with erect papillae; pappus white.

Distribution in Paraguay. Alto Paraguay, Amambay, Caaguazú, Central, Concepción, Cordillera, Guairá, Itapúa, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Tropical and subtropical South America.

Ecology. Forests.

Phenology. Flowers from August through February.

Subfamily Vernonioideae Lindl.
Tribe Vernonieae Cass.

***Cyrtocymura scorpioides* (Lam.) H. Rob.**
Figure 7F

Material examined. PARAGUAY – Ñeembucú • Camino Pilar – Estancia San Francisco Javier; 26°54′05″S, 058°22′24″W; 26.XI.2022; Soria, López & Stevens 8444 leg.; FCQ 59913.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Central and South America.

Ecology. Tropical and subtropical forests.

Phenology. Flowers from August through May.

***Lepidaploa remotiflora* (Rich.) H. Rob.**
Figure 7G

Material examined. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′43″S, 058°17′14″W; 17.VIII.2022; Soria 8343 leg.; FCQ 59912.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Caaguazú, Caazapá, Canindeyú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. South America.

Ecology. Forest edges and clearings, grasslands, prairies, and disturbed areas.

Phenology. Flowers throughout the year.

***Lessingianthus pseudoincanus* (Hieron.) Dematt. & Angulo**

Material examined. PARAGUAY – Ñeembucú • Yacaré (Guazú Cuá); 26°03'S, 057°25'W; 26.X.1991; Spichiger, Loizeau, Schlüssel & Barriera 5239 leg.; G 00026337.

Distribution in Paraguay. Central, Ñeembucú.

Global distribution. Argentina, Brazil, Paraguay.

Ecology. Grasslands, prairies, and disturbed areas.

Phenology. Flowers from October through February.

***Lessingianthus rubricaulis* (Humb. & Bonpl.) H. Rob.**

Material examined. PARAGUAY – Ñeembucú • Distrito Cerrito, estero 600 m away from Laguna Sirena; 27°22′00″S, 057°35′30″W; 10.VI.1988; Keel & Spinzi 1477 leg.; FCQ 35992.

Distribution in Paraguay. Alto Paraguay, Alto Paraná, Amambay, Boquerón, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guairá, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. South America.

Ecology. Grasslands and prairies. On sandy, rocky soils.

Phenology. Flowers throughout the year.

***Pacourina edulis* Aubl.**
Figure 7H

Material examined. PARAGUAY – Ñeembucú • Pilar, arroyo Montuoso; 26°47′59″S, 058°15′03″W; 7.II.2017; Mereles & Esquivel 10410 leg.; FCQ 56481.

Distribution in Paraguay. Alto Paraguay, Central, Concepción, Cordillera, Itapúa, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Central and South America.

Ecology. Wetlands and floodable grasslands and prairies.

Phenology. Flowers from August through March.

***Vernonanthura chamaedrys* (Less.) H. Rob.**
Figure 7I

Material examined. PARAGUAY – Ñeembucú • Circunvalación de la ciudad de Pilar; 26°51′35″S, 058°14′17″W; 17.VIII.2022; Soria 8330 leg.; FCQ 59799.

Distribution in Paraguay. Amambay, Caaguazú, Central, Concepción, Cordillera, Guairá, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes, San Pedro.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Grasslands and prairies.

Phenology. Flowers from August through May.

***Vernonia incana* Less.**

Material examined. PARAGUAY – Ñeembucú • Pilar, campo propiedad Flia. Silva; 26°51′57″S, 058°16′08″W; 26.XI.2022; Soria, López & Stevens 8453 leg.; FCQ 59922.

Distribution in Paraguay. Alto Paraná, Amambay, Central, Ñeembucú, Paraguarí, Presidente Hayes.

Global distribution. Argentina, Brazil, Paraguay, Uruguay.

Ecology. Grasslands, prairies, disturbed areas, and crop fields.

Phenology. Flowers from November through March.

DISCUSSION

In this updated list of the Asteraceae of the Ñeembucú Department of Paraguay, we added 50 new records for the department and one new record for the country, all of them resulting from our recent field work. This reinforces the necessity of efforts and financial investments in field-based botanical research in the region and country-wide. This work more than doubles the diversity of Asteraceae for Ñeembucú since the previous checklist (De Egea et al. 2012).

The most species-rich tribes documented here are in line with results of other floristic studies in the country. Eupatorieae is the largest Asteraceae tribe in Paraguay, with the most taxa previously recorded for Ñeembucú (De Egea et al. 2012), for the Asteraceae flora of Paraguayan wetlands (Soria and Mereles 2022), for the flora of the Mbaracayú Forest Nature Reserve (Peña-Chocarro et al. 2010), and even for the endemic flora of Paraguay (Peña-Chocarro and De Egea 2018). The tribes Astereae, Heliantheae and Vernonieae follow the Eupatorieae for species-richness, although the order varies by region.

The predominance of herbs and subshrubs within the Asteraceae taxa of Ñeembucú is in line with the vegetation types they occupy, since this is an area of Paraguay dominated by wetlands, savannahs, and grasslands.

Most of the listed taxa are native to Paraguay, to South America, or display a wide natural distribution within tropical America (85 species). One is an endemic taxon: *Tessaria dodoneifolia* subsp. *plucheoides*, which was previously known only from the Departments of Central and Presidente Hayes (Peña-Chocarro and De Egea 2018), but is now also documented in Ñeembucú. This species seems to be restricted to the areas associated with the banks of the Paraguay River. Three species are non-native: *Carduus acanthoides* subsp. *acanthoides*, *Cirsium vulgare* subsp. *vulgare* and *Sonchus oleraceous*: all three of which are widely recognised as invasive plants worldwide. *Sonchus oleraceous* is a well-established species in Paraguay, present throughout most of the territory, and known as a common weed in crop fields, cattle pastures, and disturbed or modified areas in general. The presence of *Carduus acanthoides* in Paraguay, however, is recorded here for the first time, while the first record of *Cirsium vulgare* for the country was made by De Egea et al. (2012). These two Cardueae species, native to the Old World and North America, respectively (Susanna and Garcia-Jacas 2009), are also notorious for their invasive, weedy behaviour (Cabrera 1974; Lorenzi 2008), and are naturally associated with temperate climates. Consequently, their first records from

the south of Paraguay could indicate an escalating dispersion process of these invasive plants from temperate to subtropical climates.

Asteraceae are well known for their ability to colonize open, recently modified and disturbed areas, to the point of becoming highly problematic weeds. About 17% of the species documented are widespread colonizers, but two of them in particular, *Bidens pilosa* and *Erigeron bonariensis*, have been mentioned in the literature as two of the most frequent, abundant, and resistant weeds in Paraguay (De Egea et al. 2016) as well as in other countries of the region (Lorenzi 2008; Guglieri-Caporal et al. 2011; Ferrari 2012). They show great plasticity and resilience, high adaptability to different types of soils and climates, they produce high volumes of biomass and a great number of seeds.

The results of our study emphasize the relevance of carrying out plant expeditions and ongoing monitoring efforts, since, as already pointed out by De Egea et al. (2012), the knowledge of the biodiversity of Ñeembucú is far from complete, not only taking into consideration other ecologically and taxonomically important plant families, but also elements of the fauna, vulnerable ecosystems, and ecological processes. While Ñeembucú is not considered a "hotspot" area for conservation efforts (Dinerstein et al. 1995; Myers et al. 2000), the savannahs, grasslands, prairies, and wetlands of Ñeembucú are unique in terms of biodiversity. Historically, the ecosystems of Ñeembucú have remained in pristine condition until very recently, mainly due to their isolation from the floodable terrain and lack of drivable roads. However; the area is now currently facing a process of increasing habitat loss and land use change due to the expansion of forestry and agricultural activities. It is hoped that this checklist will contribute towards a better knowledge of the Ñeembucú biodiversity, to inspire further studies and the systematization of data, and to prioritise initiatives of national and global biodiversity conservation.

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ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

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Author contributions

Conceptualization: NS. Data curation: NS. Formal analysis: NS, JDE. Funding acquisition: NS. Investigation: NS, JDE. Methodology: NS, JDE. Project administration: NS. Resources: NS. Software: NS, JDE. Supervision: NS. Validation: NS, JDE. Visualization: JDE. Writing – original draft: NS. Writing – review and editing: JDE.

Author ORCID iDs

Nélida Soria Rey https://orcid.org/0000-0002-2818-4185
Juana De Egea Elsam https://orcid.org/0000-0002-4388-9052

Data availability

All data that support the findings of this study are available in the main text.

REFERENCES

Acevedo C, Fox J, Gauto R, Granizo T, Keel S, Pinazzo J, Spinzi L, Sosa W, Vera V (1990) Áreas Prioritarias para la Conservación en la Región Oriental del Paraguay. Centro de Datos para la Conservación, Asunción, Paraguay, 99 pp.

Benítez D, Núñez JM, Aguilera L (2023) Compendio Estadístico Ambiental 2021. Instituto Nacional de Estadística, Gobierno del Paraguay, Asunción, Paraguay, 116 pp.

Bueno ML, Leite V, Pontara V, Teixeira A (2017) Floristic distributional patterns in a diverse ecotonal area in South America. Plant Ecology 218: 1171–1186. https://doi.org/10.1007/s11258-017-0759-1

Cabrera AL (1974) Compositae. In: Burkart A (Ed.) Flora Ilustrada de Entre Ríos (Argentina), Parte VI: Dicotiledoneas Metaclamideas (Gamopétalas). Colección Científica del INTA, Buenos Aires, Argentina, 106–538.

Cabrera AL, Dematteis M, Freire SE (2009) Compositae VI; Asteroideae: Senecioneae, Vernonieae. In: Ramella L, Perret P (Eds.) Flora del Paraguay 39. Conservatoire et Jardin botaniques de la Ville de Genève, Missouri Botanical Garden, Genève, Suisse, 279 pp.

Cabrera AL, Freire SE (1998) Compositae V; Asteroideae: Inuleae, Mutisieae. In: Spichiger R, Ramella L (Eds.) Flora del Paraguay 27. Conservatoire et Jardin botaniques de la Ville de Genève, Geneva, Switzerland & Missouri Botanical Garden, St. Louis, USA, 223 pp.

Cabrera AL, Holmes WC, McDaniel S (1996) Compositae III; Asteroideae, Eupatorieae. In: Spichiger R, Ramella L (Eds.) Flora del Paraguay 25. Conservatoire et Jardin botaniques de la Ville de Genève, Missouri Botanical Garden, Genève, Suisse, 349 pp.

Cabrera AL, Willink A (1973) Biogeografía de América Latina. Monografía 13, Serie de Biología, OEA, Washington DC, USA, 120 pp.

Cartes J, Fontana J, Yanosky A (2016) Una aproximación hacia las definiciones eco-regionales del sur de la Región Oriental del Paraguay. Extensionismo, Innovación y Transferencia Tecnológica 3: 13–20.

CHG (Catalogue des herbiers de Genève) (2024) Conservatoire & Jardin botaniques de la Ville de Genève. http://www.ville-ge.ch/musinfo/bd/cjb/chg. Accessed on: 2024-06-08.

Compositae Working Group (CWG) (2024). Global Compositae Database. https://www.compositae.org/gcd. Accessed on: 2024-06-21.

De Egea J, Mereles F, Peña-Chocarro MC, Céspedes G (2016) Checklist of the crop weeds of Paraguay. PhytoKeys 73: 13–92. https://doi.org/10.3897/phytokeys.73.10135

De Egea J, Pena-Chocarro M, Espada C, Knapp S (2012) Checklist of vascular plants of the Department of Ñeembucú, Paraguay. PhytoKeys 9: 1–165. https://doi.org/10.3897/phytokeys.9.2279

DGEEC (2002) Atlas Censal del Paraguay. Secretaría Técnica de Planificación del Desarrollo Económico y Social de la Presidencia de la República, Asunción, Paraguay, 171–182.

Dinerstein E, Olson DM, Graham DJ, Webster AL, Primm SL, Bookbinder MP, Ledec G (1995) A conservation assessment of the terrestrial ecoregions of Latin American and the Caribbean. World Wildlife Fund & the World Bank, Washington, DC, USA, 129 pp.

Ferrari G (2012) Malezas y sus dosis de control. Monsanto Argentina S.A.I.C, Buenos Aires, Argentina, 247 pp.

Fogel R (2000) La Ecorregión de Ñeembucú: infortunio, dignidad y sabiduría de sus antiguos pobladores. Centro de Estudios Rurales Interdisciplinarios, Universidad Nacional de Pilar, Asunción, Paraguay, 206 pp.

Funk VA, Alfonso S, Stuessy TF, Robinson H (2009) Chapter 11: Classification of Compositae. In: Funk VA, Alfonso S, Stuessy TF, Bayer RJ (Eds.) Systematics, Evolution, and Biogeography of Compositae. International Association for Plant Taxonomy, Vienna, Austria, 171–189.

Guglieri-Caporal A, Machado Caporal FJ, Leite Kufner DC, de Matos Alves F (2011) Flora invasora de cultivos de aveia-preta, milho e sorgo em região de cerrado do Estado de Mato Grosso do Sul, Brasil. Bragantia, Campinas 70 (2): 247–254.

Huang C, Kim S, Song K, Townshend J, Davis P, Altstatt A, Rodas O, Yanosky A, Clay R, Tucker C, Musinsky J (2009) Assessment of Paraguay's forest cover change using Landsat observations. Global and Planetary Change 67: 1–12. https://doi.org/10.1016/j.gloplacha.2008.12.009

IPNI (International Plant Names Index) (2024). http://www.ipni.org. The Royal Botanic Gardens, Kew, Harvard University Herbaria & Libraries and Australian National Herbarium. Accessed on: 2024-01-03.

Katinas L, Gutiérrez DG, Grossi M, Crisci JV (2007) Panorama de la familia Asteraceae (= Compositae) en la República Argentina. Boletín de la Sociedad Argentina de Botánica 42 (1–2): 113–129.

Lorenzi H (2008) Plantas daninhas do Brasil: terrestres, aquáticas, parasitas e tóxicas. 4ª Edição. Instituto Plantarum de Estudos da Flora LTDA, Nova Odessa, Brazil, 640 pp.

MADES/PNUD (2020) Plan Estratégico del Sistema Nacional de Áreas Silvestres Protegidas de Paraguay (SINASIP) 2020–2030. Proyecto Bosques para el Crecimiento Sostenible, Asunción, Paraguay, 495 pp.

Mandel JR, Dikow RB, Siniscalchi CM, Thapa R, Watson LE, Funk VA (2019) A fully resolved backbone phylogeny reveals numerous dispersals and explosive diversifications throughout the history of Asteraceae. Proceedings of the National Academy of Sciences of the United States of America 116 (28): 14083–14088. https://doi.org/10.1073/pnas.1903871116

Mereles F (2004) Los humedales del Paraguay: principales tipos de vegetación. In: Salas D, Mereles F, Yanosky A (Eds.) Humedales del Paraguay. RAMSAR, Fundación Moisés Bertoni, Diners International, Asunción, Paraguay & Departament of State, Washington DC, USA, 67–88.

Morrone JJ (2014). Biogeographical regionalisation of the Neotropical region. Zootaxa 3782 (1): 001–110. https://doi.org/10.11646/zootaxa.3782.1.1

Myers N, Mittermeier RA, Mittermeier CG, da Fonseca GAB, Kent J (2000) Biodiversity hotspots for conservation priorities. Nature 403: 853–858. https://doi.org/10.1038/35002501

Olson D, Dinerstein E, Wikramanayake E, Burgess N, Powell G, Underwood E, D'amico J, Itoua I, Strand H, Morrison J, Loucks C, Allnutt T, Ricketts T, Kura Y, Lamoreux J, Wettengel W, Hedao P, Kassem K (2001) Terrestrial ecoregions of the world: a new map of life on Earth. BioScience 51: 933–938. https://doi.org/10.1641/0006-3568(2001)051[0933:TEOTWA]2.0.CO;2

Palazzesi L, Pellicer J, Barreda VD, Loeuille B, Mandel J, Pokorny L, Siniscalchi CM, Tellería MC, Leitch IJ, Hidalgo O (2022) Asteraceae as a model system for evolutionary studies: from fossils to genomes. Botanical Journal of the Linnean Society 200: 1–22. https://doi.org/10.1093/botlinnean/boac032

Peña-Chocarro M, De Egea J (2018) Checklist of the endemic vascular plants of Paraguay. Phytotaxa 384: 1–74. https://doi.org/10.11646/phytotaxa.384.1.1

Peña-Chocarro M, Espada-Mateos C, Vera M, Céspedes G, Knapp S (2010) Updated checklist of vascular plants of the Mbaracayú Forest Nature Reserve (Reserva Natural del Bosque Mbaracayú), Paraguay. Phytotaxa 12: 1–224. https://doi.org/10.11646/phytotaxa.12.1.1

Rieu-Clarke A, Moynihan R, Magsig B-O (2012) UN Watercourses Convention user's guide. IHP-HELP Centre for Water Law, Policy and Science, University of Dundee, Dundee, UK, 273 pp.

Soria N (2016) Conservación del Género *Baccharis* (Asteraceae) en Paraguay. Rojasiana 15: 19–55.

Soria N, Mereles F (2022) Las especies de Asteraceae de los humedales de Paraguay. Bonplandia 31 (2): 129–142. https://doi.org/10.30972/bon.3126016

Soria N, Zardini EM (1995) Sinopsis de la tribu Astereae en Paraguay. In: Hind DJN, Jeffrey C, Pope GV (Eds.) Advances in Compositae Systematics. Royal Botanical Gardens, Kew, United Kingdom, 355–378.

Spichiger R, Palese R, Chautems A, Ramella L (1995) Origin, affinities and diversity hot spots of the Paraguayan dendrofloras. Candollea 50 (2): 515–537.

Spichiger R, Stauffer F, Mereles F, Soloaga M, Loizeau P (2011) Claves de identificación para las familias de Angiospermas de Paraguay. In: Flora del Paraguay, Serie especial 8. Conservatoire et Jardin Botaniques de la Ville de Genève, Geneva, Switzerland & Missouri Botanical Garden, St. Louis, USA, 255 pp.

Susanna A, Garcia-Jacas N (2009) Cardueae (Carduoideae). In: Funk VA, Alfonso S, Stuessy TF, Bayer RJ (Eds.) Systematics, Evolution, and Biogeography of Compositae. International Association for Plant Taxonomy, Vienna, Austria, 157–169.

Susanna A, Baldwin BG, Bayer RJ, Bonifacino JM, Garcia-Jacas N, Keeley SC, Mandel JR, Ortiz S, Robinson H, Stuessy TF (2020) The classification of the Compositae: a tribute to Vicki Ann Funk (1947–2019). Taxon 69 (4): 807–814. https://doi.org/10.1002/tax.12235

Thiers B (2024) Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. https://sweetgum.nybg.org/science/ih/. Accessed on: 2024-01-04.

Tropicos.org (2024) Missouri Botanical Garden. https://tropicos.org. Accessed on: 2024-06-08.

Vogt C, Mereles F (2005) Una contribución al estudio de los humedales de la cuenca del Arroyo Ñeembucú, Departamento Ñeembucú, Paraguay. Rojasiana 7 (1): 5–20.

Yanosky A, Salas-Dueñas D (2004) Amenazas a los humedales paraguayos. In: Salas-Dueñas D, Mereles F, Yanosky A (Eds.) Los humedales del Paraguay. Comité Nacional de Humedales, Asunción, Paraguay, 13–28.

Zuloaga F, Belgrano M, Zanotti C (2019) Actualización del Catálogo de las plantas vasculares del Cono Sur. Darwiniana, Nueva Serie 7 (2): 208–278. https://doi.org/10.14522/darwiniana.2019.72.861